Final Regional Climate Action Plan

May 28, 2014

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Kings County Association of Governments

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Acronyms

AB	Assembly Bill
CAL FIRE	California Department of Forestry and Fire Protection
CALGreen	California Green Building Standards Code
CalRecycle	California Department of Resources Recycling and Recovery
Caltrans	California Department of Transportation
CAP	Climate Action Plan
CARB	California Air Resources Board
CSD	California Department of Community Services and Development
CEQA	California Environmental Quality Act
CH_4	Methane
CO_2	Carbon dioxide
CO_2e	Carbon dioxide equivalent
EPA	Environmental Protection Agency
GHG	Greenhouse gas
HFC	Hydrofluorocarbons
IPCC	Intergovernmental Panel on Climate Change
KCAG	Kings County Association of Governments
KCAPTA	Kings County Area Public Transit Agency
KCWMD	Kings County Waste Management District
kWh	Kilowatt hours
MPO	Metropolitan Planning Organization
MT	Metric tons
N_2O	Nitrous oxide
O_3	Ozone
PFCs	Perfluorocarbons
RTP	Regional Transportation Plan
SB	Senate Bill
SCS	Sustainable Communities Strategy
SF_6	Sulfur Hexaflouride
SJVAPCD	San Joaquin Valley Air Pollution Control District
SP	Service Population
VMT	Vehicle miles traveled

EXECUTIVE SUMMARY

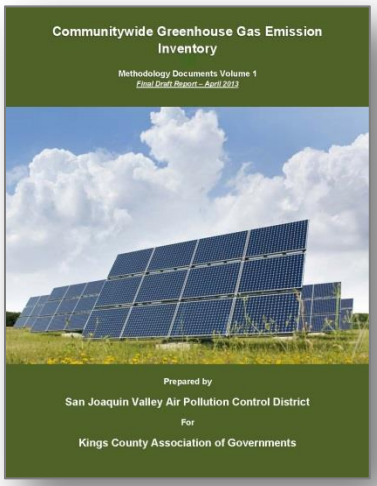
Executive Summary

The Regional Climate Action Plan (CAP) is a long-range policy document that identifies cost-effective measures to reduce greenhouse gas (GHG) emissions from activities within Kings County consistent with California State Assembly Bill (AB) 32. Implementation of the measures will not only reduce GHG emissions, but also support local economic development and improve public health and quality of life.

While the CAP is a voluntary coordinated effort between the participating local government agencies,[1] the intent of this document is to be used as reference by the agencies, as desired, in the context of AB 32. Specifically this CAP is designed to:

- Benchmark the region's 2005 baseline GHG emissions and 2020 projected emissions relative to the statewide emissions target.
- Provide a roadmap for each local agency, as desired, to achieve the State recommended target of 15 percent below 2005 levels by the year 2020, consistent with AB 32.
- Support the streamlining of the environmental review process for future projects within the participating local jurisdictions in accordance with State California Environmental Quality Act (CEQA) Guidelines Sections 15152 and 15183.5.

Regional GHG Emissions


Communitywide Greenhouse Gas Emission Inventory
Methodology Documents Volume 1
Final Draft Report – April 2013
Prepared by
San Joaquin Valley Air Pollution Control District
For
Kings County Association of Governments

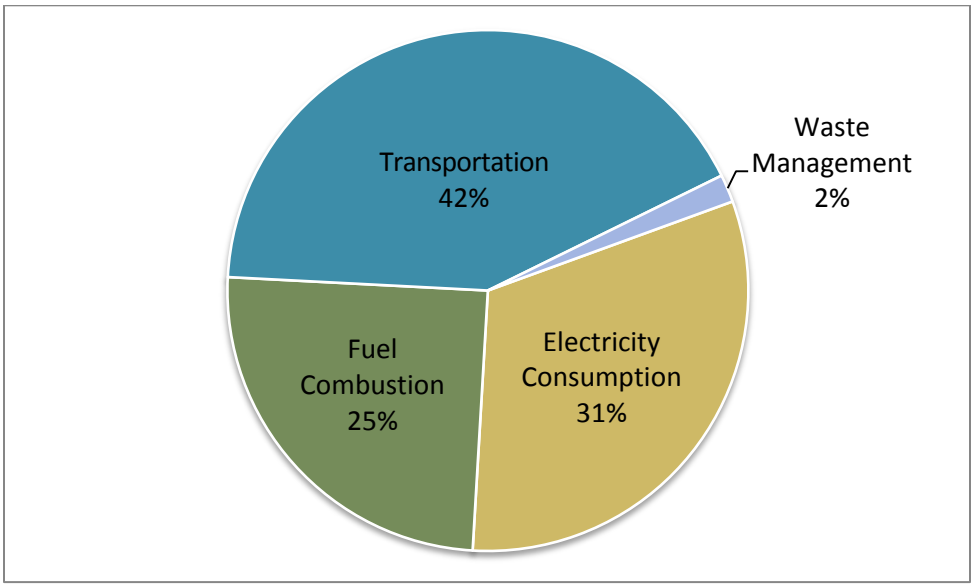
The Kings County Community-Wide Greenhouse Gas Emissions Inventory was prepared by the San Joaquin Valley Air Pollution Control District (SJVAPCD) in April 2013 to identify the major sources and quantities of GHG emissions produced county-wide in 2005 and forecast how emissions may change over time. The GHG emissions inventory provides information on the scale of emissions from various sources and where the opportunities to reduce emissions lie. It also provides a baseline against which the region and local agencies can measure its progress in reducing GHG emissions.

In 2005, the region emitted approximately 1,139,135 metric tons of carbon dioxide equivalent GHG emissions (MT CO_2e), as a result of the following categories of activities: electricity consumption in residential, commercial and industrial buildings; residential, commercial, and industrial fuel (i.e., natural gas) combustion, transportation,[2] and waste management. As shown in **Figure ES-1**, the largest sources of GHG emissions were

[1] At this time, the cities of Avenal and Hanford have participated in the development of the CAP.

transportation (42 percent), electricity consumption (31 percent), and fuel combustion (25 percent). The remainder of emissions resulted from waste management (2 percent).

Figure ES-1: Regional GHG Emissions by Source (2005)



The GHG emissions inventory also includes information on and quantifies the GHG benefits associated with carbon sequestration, including commercial composting, resource recovery, and urban forests. Together these sources were estimated to sequester or capture 92,331 MT CO_2e in 2005. As shown in **Table ES-1** below, taking into account the amount of carbon sequestered county-wide, the region's net total GHG emissions were 1,046,804 MT CO_2e in 2005.

Table ES-1: Net Regional GHG Emissions

Source	2005 GHG Emissions (MT CO_2e)
Total GHG Emissions	1,139,135
Carbon Sequestration	-92,331
Net GHG Emissions	**1,046,804**

[2] Transportation emissions are the result of diesel, gasoline, compressed natural gas, and liquid petroleum gas fuel used in on- and off-road vehicles. Transportation emissions exclude pass-through vehicle trips that do not have an origin or destination within the region. Emissions take into account the regional mix of vehicle classes and model years, as well as ambient conditions and travel speeds that determine fuel efficiency. Emissions resulting from airports and rail are not included in the transportation source category of this CAP because they are operated as part of a larger statewide system and beyond local government's ability to influence. Refer to **Appendix A** for further information.

The GHG Emissions Inventory report also includes a forecast of how GHG emissions are projected to change in the future based on projected changes in population, jobs, and vehicle miles traveled. The forecast provides a "business-as-usual" estimate of how emissions will change in the year 2020 if consumption trends and behavior continue as they did in 2005. With the exception of the on-road vehicle transportation and waste management categories, the business-as-usual emissions forecast does not account for reductions in GHG emissions that are anticipated to occur as a result of several State measures, including the Renewable Portfolio Standard, Advanced Clean Cars, and Title 24 Building Energy Efficiency Standards.[3]

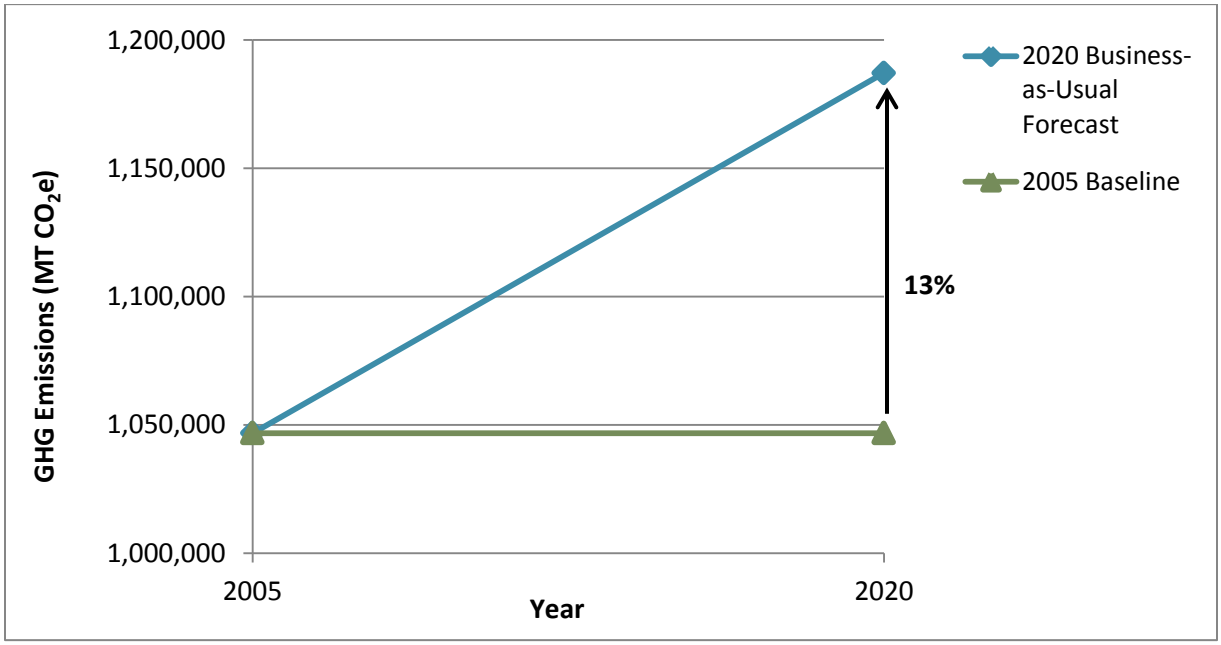
Under the business-as-usual forecast scenario, the region's GHG emissions are projected to grow by approximately 13 percent by the year 2020, from 1,046,804 MT CO_2e to 1,187,184 MT CO_2e. Emissions associated with waste management are projected to experience the highest level of growth (29 percent). This high level of growth projected in the waste management category is a result of waste placement projections provided by Kings County Waste Management District (KCWMD), which were used in the projection of 2020 landfill emissions. In addition, due to the methodology used to forecast on-road vehicle emissions, which as previously stated, accounts for emissions reductions that will result from the Low Carbon Fuel Standard and Pavley I, the on-road vehicle emissions source would exhibit higher growth than shown below in a true business-as-usual forecast, absent all reductions from State measures. **Table ES-2** and **Figure ES-2** show the forecast results of the business-as-usual forecast scenario.

Table ES-2: 2020 Business-As-Usual GHG Emissions Forecast

Source	2005 (MT CO_2e)	2020 (MT CO_2e)	Percent Change from 2005 to 2020
Electricity Consumption	358,694	448,985	25%
Fuel Combustion	283,536	356,616	26%
Transportation	477,343	471,934	-1%
Waste Management	19,562	25,221	29%
Other Sources	-92,331	-115,572	25%
TOTAL	**1,046,804**	**1,187,184**	**13%**

[3] The 2020 business-as-usual forecast of on-road vehicle emissions accounted for the Low Carbon Fuel Standard and Pavley I clean car standard using the California Air Resources Board's (CARB) ONROAD (2011) software. In addition, the 2020 business-as-usual forecast for waste management accounted for Landfill Methane Control Measures. Since the forecast accounts for the reductions from some State measures that will have known reductions, it is not a true "business-as-usual" forecast. However, it is referred to as such herein for comparison with the adjusted forecast which account for reductions from additional State measures that will further reduce GHG emissions, including the Renewable Portfolio Standard, the Title 24 Building Energy Efficiency Standard, and Advanced Clean Cars.

Figure ES-2: 2020 Business-As-Usual GHG Emissions Forecast



The Climate Change Scoping Plan (AB 32 Scoping Plan) (2008), prepared by the California Air Resources Board (CARB) pursuant to AB 32, identifies several State measures that are approved, programmed, and/or adopted and would reduce GHG emissions within the region including the Renewable Portfolio Standard, the Title 24 Building Energy Efficiency Standard, and Advanced Clean Cars. These State measures require no additional local action. Therefore, they were incorporated into the forecast and reduction assessment to create an "adjusted forecast," which provides a more accurate picture of future emissions growth and the responsibility of the local agencies once all applicable State measures to reduce GHG emissions have been implemented.

Under the adjusted forecast scenario, GHG emissions are projected to decrease approximately 16 percent below the 2020 business-as-usual forecast scenario to 1,000,342 MT CO_2e in 2020. This is four percent lower than the 2005 baseline emissions level of 1,046,804 MT CO_2e.**Table ES-3** summarizes the reduction in GHG emissions that would result from State measures compared to the business-as-usual forecast.

Table ES-3: Summary of State Reductions and 2020 Adjusted Forecast

	2020 GHG Emissions (MT CO_2e)*
2020 Business-as-Usual Forecast	1,187,184
Reduction from Additional State Measures[1]	-186,842
2020 Adjusted Forecast	**1,000,342**

[1]Refer to **Appendix B** for calculation details

GHG Emissions Reduction Target

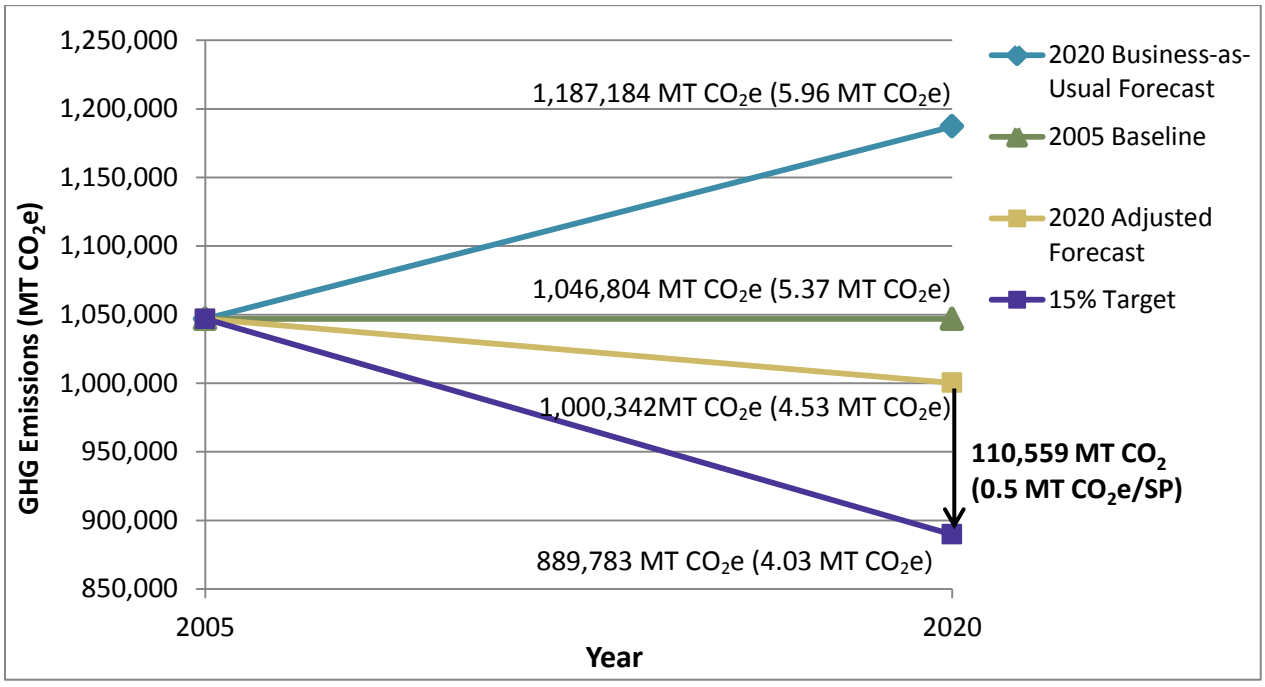
Consistent with the AB 32 Scoping Plan, this CAP identifies a regional goal to reduce GHG emissions by 15 percent below 2005 levels by 2020. Based on this target, the region's 2020 targeted GHG emissions would be 889,783 MT CO_2e. As shown in **Table ES-4**, this is equivalent to 4.03 MT CO_2e per service population (residents plus employees)(SP). To meet this targeted level of emissions, the region will need to reduce its GHG emissions by 11 percent (or 110,559 MT CO_2e) below the adjusted forecast through implementation of local and/or regional measures and actions. This equates to reducing emissions by 0.5 MT CO_2e/SP by 2020 (see **Figure ES-3**).

Table ES-4: Service Population Target

GHG Emissions Target (MT CO_2e)	889,783
Projected Population[1]	179,756
Projected Employment[1]	41,257
Projected Service Population (population + employment)	221,013
Service Population Target (MT CO_2e/SP)	**4.03**

[1]Population and employment projections were calculated by applying the growth factors used in the regional inventory (see Chapter 2) to 2005 data. 2005 population data was obtained from the California Department of Finance (2012) and 2005 employment data was obtained from the U.S. Census Bureau's OnTheMap tool (2013).

Figure ES-3: Regional Emissions, Target, and Reduction Necessary to Meet Target



GHG Reduction Measures

To achieve the GHG emissions reduction target of 15 percent below 2005 levels by 2020 (or 4.03 MT CO_2e/SP), the CAP identifies a comprehensive set of GHG reduction measures. These measures are organized into the following focus areas, or categories: Energy, Transportation and Land Use, Solid Waste, Trees and Other Vegetation, and Community Education and Outreach. The measures were selected based on consideration of the emissions reductions needed to achieve the target, the distribution of emissions revealed in the GHG Emissions Inventory, goals and policies identified in the local jurisdictions' General Plans, existing and ongoing efforts and priorities, policies and strategies of regional agencies, and the potential costs and benefits of each measure. Collectively, the measures identified in the CAP have the potential to reduce GHG emissions within the region by 114,408 MT CO_2e (or 0.52 MT CO_2e/SP) by 2020. This would bring 2020 emissions to 885,934 MT CO_2e (or 4.01 MT CO_2e/SP), which meets and slightly exceeds the necessary reductions required to meet the target.

Implementation and Monitoring

Implementation and monitoring are essential processes to ensure that the region reduces its GHG emissions and meets its target. To facilitate this, each climate action measure is identified along with implementation actions, cost and savings estimates, the GHG reduction potential (as applicable), performance indicators to monitor progress, and an implementation time frame. Measure implementation is separated into three phases: near-term (by 2016), mid-term (2017-2018), and long-term (2019-2020).

In order to ensure that measures are implemented and their progress is monitored, upon adoption of the CAP, each participating jurisdiction will establish a CAP Coordinator who will provide essential CAP oversight and coordination. This may include, as applicable, organization of a multi-departmental CAP Implementation Team comprised of key staff in selected departments, which will meet at least one time per year to assess the status of CAP efforts. The CAP Coordinator will be responsible for developing an annual progress report to the City Council that identifies the implementation status of each measure, evaluates achievement of or progress toward performance indicators (where applicable), and recommends adjustments to measures or actions, as needed. To evaluate the performance of the CAP as a whole, the region will update the GHG emissions inventory every five years, using the most up-to-date calculation methods, data, and tools.

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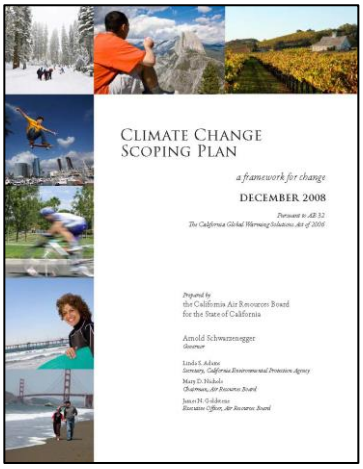
CHAPTER 1

INTRODUCTION

1.0 Introduction

The State of California adopted AB 32, the California Global Warming Solutions Act, in 2006. AB 32 establishes a target to reduce statewide GHG emissions to 1990 levels by the year 2020. It also required CARB to develop a policy plan for reaching the 2020 emissions target. The resulting AB 32 Scoping Plan was adopted by CARB in December 2008. In order to achieve the statewide target, the AB 32 Scoping Plan calls on local governments to reduce GHG emissions by approximately 15 percent from baseline levels by 2020, consistent with the statewide commitment. The AB 32 Scoping Plan, notes that local governments have broad influence and, in some cases, exclusive authority over activities that result in GHG emissions through their planning and permitting processes, local ordinances, outreach and education efforts, and municipal operations. Subsequently, in 2007, the State adopted Senate Bill (SB) 97 (the CEQA and GHG Emissions bill of 2007), which requires lead agencies to analyze and mitigate GHG emissions impacts under CEQA. These laws together create a framework for GHG emissions reductions and identify local governments as having a vital role in assisting the State in meeting its target.



This Regional CAP was prepared in recognition of the role that local governments have in helping to implement AB 32 and the need to mitigate GHG emissions under CEQA. While the Regional CAP is a voluntary coordinated effort between the participating jurisdictions, the purpose of the document is to be used as reference by the jurisdictions in the context of AB 32, as desired. This chapter describes the purpose, scope, and content of the CAP. It also summarizes the scientific and regulatory framework under which this plan has been developed.

1.1 Purpose and Scope

The Regional CAP is a long-range plan to reduce GHG emissions from activities within the region consistent with AB 32. Specifically, the CAP does the following:

- Summarizes the results of the Kings County Community-wide GHG Emissions Inventory (2013), which identifies the major sources and quantities of GHG emissions produced within the region and forecasts how these emissions may change over time.
- Identifies the quantity of GHG emissions that the region will need to reduce to meet the State-recommended target of 15 percent below 2005 levels by the year 2020, consistent with AB 32.
- Sets forth GHG reduction measures, including performance standards which, if implemented, would collectively achieve the specified GHG emission reduction target.

- Identifies steps to implement, monitor, and verify the effectiveness of the GHG reduction measures and adapt efforts moving forward.

In addition to reducing GHG emissions consistent with AB 32, implementation of the CAP measures may help achieve multiple community goals such as lowering energy costs, reducing air pollution, supporting local economic development, and improving public health and quality of life. The CAP may also be used to streamline the environmental review process for future development projects within participating jurisdictions pursuant to State CEQA Guidelines sections 15152, 15183 and 15183.5 (refer to Section 1.5, *Relationship to CEQA*). Additionally, the CAP may better position participating jurisdictions to access federal, state and private funding sources; communities with proven track records of success are better candidates for investment and also can meet the criteria for performance tracking that is often associated with grant funding.

1.2 Content

The CAP is organized into the following chapters:

1.0 Introduction – describes the purpose, scope, and content of the Regional CAP. It also summarizes the scientific and regulatory framework under which this plan has been developed.

2.0 GHG Emissions and Reduction Target – identifies the sources of GHG emissions in Kings County, and specifically those addressed in the CAP. This chapter also quantifies emissions for a baseline year (2005), forecasts how emissions are projected to change by the year 2020, and quantifies the GHG emissions reduction target for the year 2020.

3.0 GHG Reduction Measures – sets forth the GHG reduction measures, which are organized into the following categories: Energy, Transportation and Land Use, Solid Waste, Trees and Other Vegetation, and Community Education and Outreach. Each measure is presented with implementation actions, estimated GHG reductions in 2020, and estimated costs and future savings.

4.0 Implementation and Monitoring – identifies steps to implement and monitor the individual GHG reduction measures, evaluate the CAP's overall performance, and update the plan over time as needed. It also identifies potential sources of funding to implement the CAP measures.

1.3 Background and Planning Process

Development of the Regional CAP was a multi-jurisdictional collaborative process, involving the cities of Avenal and Hanford, with grant facilitation by Kings County Association of Governments (KCAG). The participating jurisdictions convened a committee of agency stakeholders (Advisory Committee), comprised of local agency staff, local citizens, and interest groups to assist in developing a feasible CAP that considers all opportunities and challenges in the region. The Advisory Committee provided regular

input on the CAP and its development, and helped identify practical and implementable measures. Public input from residents, businesses, community organizations, and elected officials was solicited throughout the process. Public meetings, including seven Advisory Committee meetings and two City Council study sessions for Avenal and Hanford, were held throughout the region to ensure equal access to all community members. In addition, a project website (www.kingscountywidecap.com) was also developed to provide community members and stakeholders the opportunity to learn about the project and provide feedback. A community survey was posted on the project website from January 14, 2014 to February 28, 2014 to solicit input regarding potential measures and implementation actions for inclusion in the CAP. Regular updates were provided throughout the course of the project to the jurisdictions, Advisory Committee, Planning Commissions, City Councils, Board of Directions and KCAG Commission to keep them apprised of the CAP's progress.

1.4 Relationship to CEQA

According to the California Natural Resources Agency (2009) and the State's Office of the Attorney General (2009), GHG emissions may be best analyzed and mitigated at a programmatic level (i.e., GHG reduction/CAP). In 2009, the California Natural Resources Agency amended the State CEQA Guidelines to add a new provision, Section 15183.5, which provides a framework for programmatic GHG emissions reduction plans (i.e., a CAP). Section 15183.5 states a plan for the reduction of GHG emissions should:

- Quantify GHG emissions, both existing and projected over a specified time period, resulting from activities within a defined geographic area;
- Establish a level, based on substantial evidence, below which the contribution to GHG emissions from activities covered by the plan would not be cumulatively considerable;
- Identify and analyze the GHGs emissions resulting from sources in the community;
- Identify a suite of specific, enforceable measures that, collectively, will achieve the emissions target;
- Establish a mechanism to monitor the plan's progress and to require amendment if the plan is falling short; and
- Be adopted in a public process following environmental review.

This CAP was developed to be consistent with State CEQA Guidelines Section 15183.5. Once the CAP is adopted following environmental review, each participating jurisdiction must demonstrate adherence to the CEQA Guidelines (Section 15183.5) requirements discussed above in order to use the CAP to tier and streamline the analysis of GHG emissions for future projects within the jurisdiction. If the requirements set forth in the CEQA Guidelines are met, the lead agency may determine that projects that are consistent with the CAP will not have significant GHG-related impacts, which can save time and money for these projects.

1.5 Scientific Background

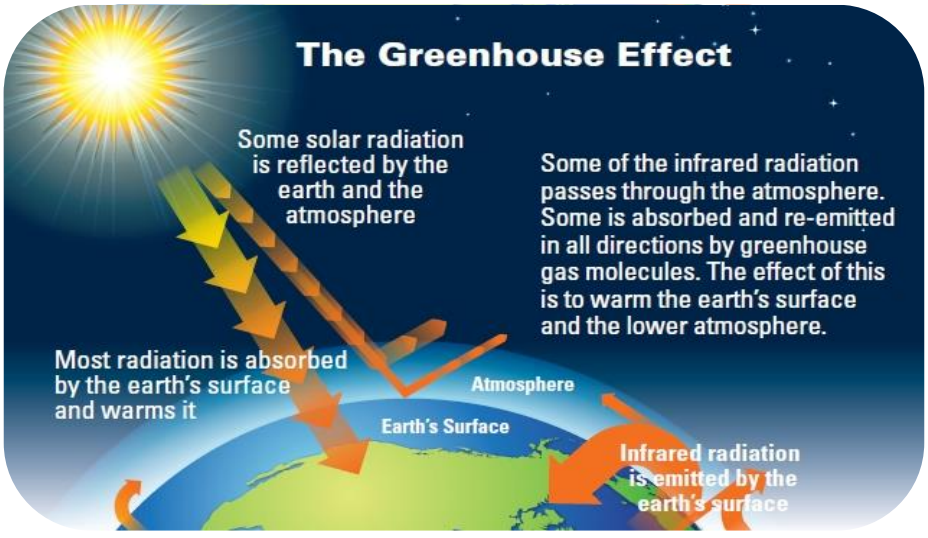
1.5.1 GHGs and Climate Change

This section provides a brief overview of the scientific background under which this CAP was developed.

Climate change refers to changes in the "average weather" or average climatic conditions that an area experiences over an extended period of time (typically decades or longer) and accounts for changes in temperature, wind patterns, precipitation, and storms.[1] Global climate change refers to a change in the climate of the Earth as a whole. Global warming, a related concept, is the observed increase in the average temperature of the Earth's surface and atmosphere caused by increased GHG emissions, which can contribute to changes in global climate patterns.

Energy from the Sun drives the Earth's weather and climate. The Earth absorbs energy from the Sun and also radiates energy back into space. A GHG is any gas (e.g., water vapor, carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and ozone) that absorbs this energy in the Earth's atmosphere. This absorption traps heat within the atmosphere and warms the Earth, which is known as the "greenhouse effect" (refer to **Figure 1-1**).

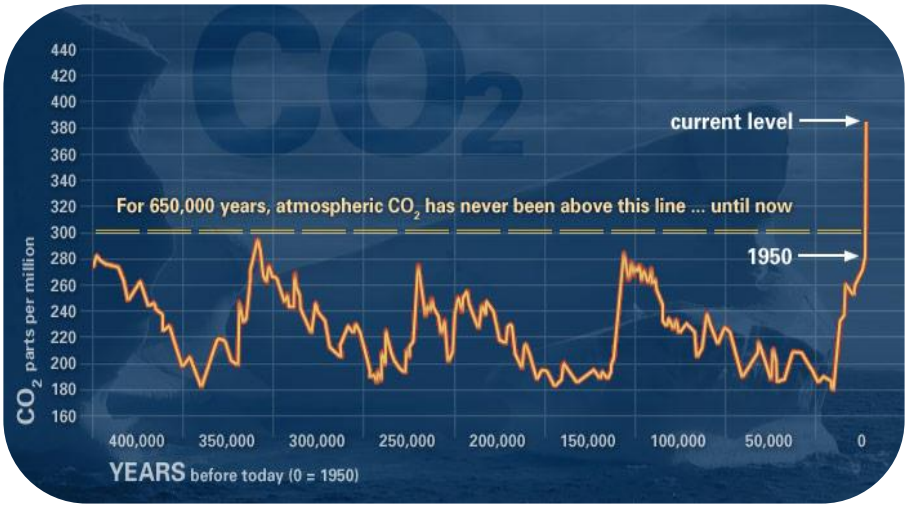
Figure 1-1: The Greenhouse Effect


The Greenhouse Effect
Some solar radiation is reflected by the earth and the atmosphere
Some of the infrared radiation passes through the atmosphere. Some is absorbed and re-emitted in all directions by greenhouse gas molecules. The effect of this is to warm the earth's surface and the lower atmosphere.
Most radiation is absorbed by the earth's surface and warms it
Atmosphere
Earth's Surface
Infrared radiation is emitted by the earth's surface

1 Weather is the short-term changes seen in temperature, clouds, precipitation, humidity, and wind in a region or a city. Climate is the "average weather" of an area measured over an extended period of time (typically decades or longer).

GHGs are the result of both natural and anthropogenic activities. The consumption of fossil fuels for power generation and transportation, forest fires, decomposition of organic waste, and industrial processes are the primary sources of GHG emissions from human activities. Naturally, the Earth maintains an approximate long-term balance between the emission of GHGs into the atmosphere and its storage in oceans and terrestrial ecosystems. Following the industrial revolution, however, increased combustion of fossil fuels (e.g., gasoline, diesel, coal, etc.) and other industrial processes have contributed to a rapid increase in atmospheric levels of GHGs (refer to **Figure 1-2**) (NOAA, 2009).

Figure 1-2: Historic Fluctuations and Recent Increases in Atmospheric CO_2



This graph, based on the comparison of atmospheric samples contained in ice cores and more recent direct measurements, provides evidence that atmospheric CO_2 has increased since the Industrial Revolution (National Aeronautics and Space Administration (NASA), 2011).

The principal GHGs that enter the atmosphere as a result of human activities are discussed below.

- **Carbon Dioxide** (CO_2) is released into the atmosphere through the burning of fossil fuels (oil, natural gas, and coal), solid waste, trees and wood products, and also as a result of other chemical reactions (e.g., cement production) and deforestation. CO_2 is also removed from the atmosphere (or "sequestered") when it is absorbed by plants as part of the biological carbon cycle.
- **Methane** (CH_4) is emitted during the production and transport of coal, natural gas, and oil. CH_4 emissions also result from agricultural practices, such as the raising of livestock, and by the decomposition of organic waste in landfills.
- **Nitrous oxide** (N_2O) is emitted during agricultural and industrial activities, as well as during the burning of fossil fuels and solid waste.

- **Fluorinated gases** (i.e., hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride (SF_6)) are synthetic GHGs that are emitted from a variety of industrial processes (e.g., aluminum production) and used in commercial, industrial, and consumer products (e.g., automobile air conditioners and refrigerants). These gases are typically emitted in smaller quantities, but because they are potent GHG, they are sometimes referred to as "high intensity" or "high global warming potential" gases.

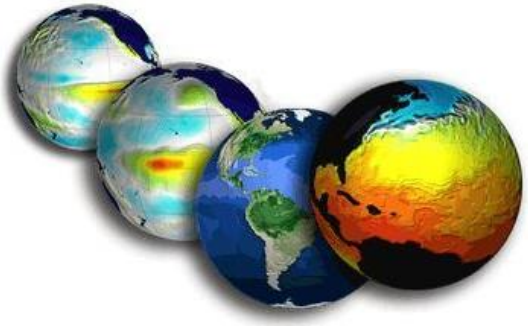
Each GHG differs in its ability to trap heat in the atmosphere, or in its intensity factor. For example, one pound of CH_4 has 21 times more heat capturing potential than one pound of CO_2. To simplify reporting and analysis of GHGs, GHG emissions are typically reported in terms of metric tons of CO_2 equivalent (MT CO_2e) units. When dealing with an array of emissions, the gases are converted to their CO_2 equivalents for comparison purposes. **Table 1-1** shows the intensity factor for the six most abundant GHGs.

Table 1-1: Intensity Factor of GHGs

GHG	Global Warming Potential (compared to CO_2)
Carbon Dioxide	1
Methane	21
Nitrous Oxide	310
Hydrofluorocarbons	140-11,700
Perflourocarbons	6,500-9,200
Sulfur Hexaflouride	23,900

Notes: Each of the GHGs listed above differs in its ability to absorb heat in the atmosphere, or in its intensity factor. The values presented above are based on the Intergovernmental Panel on Climate Change (IPCC) Second Assessment Report and United Nations Framework Convention on Climate Change reporting guidelines (IPCC, 1996). Although the IPCC Fourth Assessment Report presents different estimates, the current inventory standard relies on the Second Assessment Report's intensity factors to comply with reporting standards and consistency with regional and national inventories (USEPA, 2010).

1.5.2 CLIMATE CHANGE IMPACTS



Increases in the globally averaged atmospheric concentration of GHGs will cause the lower atmosphere to warm, in turn inducing a myriad of changes to the global climate system. These large-scale changes will have unique and potentially severe impacts in the western United States, California, and the San Joaquin Valley. Current research efforts coordinated through CARB, California Energy Commission, California Environmental Protection Agency (EPA), University of California system, and other entities are examining the specific changes to California's climate that will occur as the Earth's surface warms.

In 2009, California adopted a statewide Climate Adaptation Strategy that summarizes climate change impacts and recommends adaptation strategies across seven sectors: Public Health, Biodiversity and Habitat, Oceans and Coastal Resources, Water, Agriculture, Forestry, and Transportation and Energy. The 2009 Climate Adaptation Strategy was the first of its kind in the use of downscaled climate models to more accurately assess statewide climate impacts as a basis for providing guidance for establishing actions that prepare, prevent, and respond to the anticipated effects of climate change. As discussed throughout the document, rising temperatures affect local and global climate patterns, and these changes are forecasted to manifest themselves in a number of ways, including:

- **Heat Waves** – more frequent, longer, and more-extreme heat waves, thereby increasing energy demand and bringing about public health threats in the process;
- **Air Quality** – increased production of air pollutants, especially O_3, due to higher air temperatures, which can exacerbate respiratory and cardiovascular diseases;
- **Wildfires** – increased wildfire frequency, intensity, and duration, thereby threatening public health and plant and animal species;
- **Water Supply** – decreased water supply, more frequent drought conditions, and increased demand with implications for the community and environment;
- **Infectious Disease** – increase risk of contracting infectious diseases from mosquitoes, ticks, and rodents, such as West Nile Virus and Hantavirus;
- **Biodiversity and Habitats** – loss of plant and animal species, and their habitats ;
- **Agriculture** – decreased production from crops sensitive to temperature increases and decreased water supply, and increase in various pests; and
- **Energy Supply** – more frequent power outages due to increased electricity demand (California Natural Resources Agency, 2009).

1.6 Regulatory Setting

This section summarizes the federal, state, and regional legislation, regulations, policies, and plans that have guided the preparation and development of this CAP.

1.6.1 FEDERAL

Clean Air Act. The U.S. EPA is the federal agency responsible for implementing the Clean Air Act. The U.S. Supreme Court ruled in its decision in Massachusetts et al. v. U.S. EPA et al., issued on April 2, 2007, that CO_2 is an air pollutant as defined under the Clean Air Act and that the U.S. EPA has the authority to regulate emissions of GHGs as pollutants. In 2011, the U.S. EPA began regulating GHG emissions from new power plants and refineries through a set of New Source Performance Standards. These regulations are found in 40 CFR Part 60 and apply to new, modified and reconstructed affected

facilities in specific source categories such as manufacturers of glass, cement, rubber tires and wool fiberglass.

Energy Independence and Security Act. The Energy Independence and Security Act of 2007 includes several provisions that will increase energy efficiency and the availability of renewable energy, which in turn will reduce GHG emissions. First, the Act sets a Renewable Fuel Standard that requires fuel producers to use at least 36 billion gallons of biofuel by 2022. Second, it increased Corporate Average Fuel Economy Standards to require a minimum average fuel economy of 35 miles per gallon for the combined fleet of cars and light trucks by 2020. Third, it includes a variety of new standards for lighting and for residential and commercial appliance equipment, including residential refrigerators, freezers, refrigerator-freezers, metal halide lamps, and commercial walk-in coolers and freezers.

1.6.2 STATE OF CALIFORNIA

The State of California has been proactive in working to reduce emissions and has a long history of addressing energy and climate issues spanning the last 40 years. In 1988, AB 4420 (Sher, Chapter 1506, Statutes of 1988) designated the California Energy Commission as the lead agency for climate change issues in California. Since that time, numerous initiatives in California have addressed climate change and energy efficiency, the majority of legislation passed since 2000. These initiatives have strengthened the ability of entities in California to engage in accurate data collection and have created targets and regulations that will directly lead to reductions in GHG emissions. These initiatives are described below.

Executive Order S-3-05. Executive Order S-3-05, issued in 2005, was the first comprehensive state policy to address climate change. It established ambitious GHG reduction targets for the State: reduce GHG emissions to 2000 levels by 2010, to 1990 levels by 2020 and to 80 percent below 1990 levels by 2050. This Executive Order is binding only for State agencies and has no force of law for local governments. However, S-3-05 is important for two reasons. First, it obligated State agencies to implement GHG emission reduction strategies. Second, the signing of the Executive Order sent a signal to the Legislature about the framework and content for legislation to reduce GHG emissions as a necessary step toward climate stabilization.

Assembly Bill 32 (California Global Warming Solutions Act of 2006). AB 32 codified the State's 2020 GHG emissions target by directing CARB to reduce California's statewide emissions to 1990 levels by 2020. AB 32 also required CARB to develop a policy plan for reaching the 2020 emissions target and to adopt and enforce regulations to implement the plan. The resulting AB 32 Scoping Plan was adopted by CARB in December 2008. Key elements of the plan for achieving the 2020 target include:

- Adopting and implementing measures pursuant to existing state laws and policies, including California's goods movement measures and the Low Carbon Fuel Standard
- Expanding energy efficiency programs and green building practices
- Reducing CH_4 emissions at landfills
- Developing a California cap-and-trade program
- Establishing and seeking to achieve reduction targets for transportation-related GHG emissions
- Increasing waste diversion, composting, and commercial recycling toward zero-waste
- Strengthening water efficiency programs
- Preserving forests that sequester CO_2

Although the AB 32 Scoping Plan does not identify specific reductions for local governments, it identifies overall reductions from local government operations and land use decisions as a strategy to meet the 2020 target. The AB 32 Scoping Plan states that land use planning and urban growth decisions will play an important role in the State's GHG reductions because local governments have primary authority to plan, zone, approve, and permit how land is developed to accommodate population growth and the changing needs of their jurisdictions. It further acknowledges that decisions on how land is used will have large impacts on the GHG emissions that will result from the transportation, housing, industry, forestry, water, agriculture, electricity, and natural gas emission sectors. However, the AB 32 Scoping Plan stopped short of identifying mandatory targets for local government compliance. Instead, it encourages local governments to adopt a target for City government and community-wide emissions that parallels the State's AB 32 target and reduces emissions by approximately 15 percent below "current" levels by 2020.[2]

Senate Bill 97. SB 97 (2007) established that GHG emissions and the effects of GHG emissions are appropriate subjects for CEQA analysis and required the Governor's Office of Planning and Research to revise the State CEQA Guidelines to include guidance for the analysis of GHG impacts under CEQA. The guidelines were adopted on December 31, 2009.

Assembly Bill 1493 (Pavley Regulations). AB 1493 (referred to as Pavley I) (2002) directed CARB to develop and adopt standards for vehicle manufacturers to reduce GHG emissions coming from passenger vehicles and light-duty trucks at a "maximum feasible and cost effective reduction" by January 1, 2005. Pavley I took effect for model years starting in 2009 to 2016 and Pavley II will cover 2017 to 2025. Fleet average emission standards would reach 22 percent reduction by 2012 and 30 percent by 2016.

2 "Current" as it pertains to the AB 32 Scoping Plan is commonly understood as sometime between 2005 and 2008.

Executive Order S-1-07 (Low Carbon Fuel Standard). This 2007 order requires fuel providers to reduce the carbon intensity of California's transportation fuels by at least 10 percent by 2020.

Senate Bill 375. SB 375 (2008) supports implementation of AB 32 by aligning regional transportation planning efforts with land use and housing allocations in order to reduce transportation-related GHG emissions. Specifically, SB 375 directed CARB to set regional GHG emissions targets for passenger vehicles and light trucks for the years 2020 and 2035 for each Metropolitan Planning Organization (MPO) region, which were adopted in February 2011. For KCAG, CARB issued a 5 percent per capita reduction target from 2005 levels by 2020 and a 10 percent per capita reduction target by 2035 (CARB, 2011). These targets apply to the KCAG region as a whole, and not to individual cities or sub-regions. In 2005, GHG emissions from passenger vehicles in the KCAG region were approximately 13.4 pounds CO2e per capita. Therefore, KCAG must reduce emissions to at least 12.7 pounds CO2e per capita by 2020 and to 12.1 pounds CO2e per capita by 2035 to meet the target (CARB, 2010). KCAG is currently in the process of preparing a 2014 Regional Transportation Plan and Sustainable Communities Strategy (RTP-SCS) which will detail how the region will meet the SB 375 target.

Senate Bill 1078, Senate Bill 107, and Senate Bill 2X (Renewables Portfolio Standard). Established in 2002 under SB 1078, and accelerated in 2006 under SB 107, California's Renewables Portfolio Standard required investor-owned utilities, electric service providers, and community choice aggregators to increase procurement from eligible renewable energy resources by at least 1 percent of their retail sales annually, until they achieved 20 percent by 2010. SB 2X raises the target from the current 20 percent, requiring private and public utilities to obtain 33 percent of their electricity from renewable energy sources by 2020.

Senate Bill 1368. SB 1368 (2006) directs the California Energy Commission and the California Public Utilities Commission to adopt a performance standard for GHG emissions for the future electricity used in California, regardless of whether it is generated in-state or purchased from other states.

Assembly Bill 811. AB 811 (2008) authorizes California cities and counties to designate districts within which willing property owners may enter into contractual assessments to finance the installation of renewable energy generation and energy efficiency improvements that are permanently fixed to the property. These financing arrangements would allow property owners to finance renewable energy generation and energy efficiency improvements through low-interest loans that would be repaid as an item on the property owner's property tax bill.

California Green Building Code. The California Green Building Code (2008) (CALGreen) is the statewide green building code, which was developed to provide a consistent approach for green building within California. It lays out minimum requirements for newly constructed buildings in California, which will reduce GHG emissions through improved efficiency and process improvements. It requires builders to install plumbing that cuts indoor water use by as much as 20 percent, divert 50

percent of construction waste from landfills to recycling, and use low-pollutant paints, carpets, and floors.

California Code of Regulations Title 24, Part 6. Although it was not originally intended specifically to reduce GHG emissions, California Code of Regulations Title 24, Part 6: California's Energy Efficiency Standards for Residential and Nonresidential Buildings, was first adopted in 1978 in response to a legislative mandate to reduce California's energy consumption, which in turn reduces fossil fuel consumption and associated GHG emissions. The standards are updated periodically to allow consideration and possible incorporation of new energy-efficient technologies and methods. The California Energy Commission estimates that the 2008 standards reduce consumption by 10 percent for residential buildings and 5 percent for commercial buildings, relative to the previous standards. For projects implemented after January 1, 2014, the California Energy Commission estimates that the 2013 Title 24 energy efficiency standards will reduce consumption by 25 percent for residential buildings and 30 percent for commercial buildings, relative to the 2008 standards. These percentage savings relate to heating, cooling, lighting, and water heating only and do not include other appliances, outdoor lighting that is not attached to buildings, plug loads, or other energy uses.

Assembly Bill 341. AB 341 (2011) establishes a new policy goal of the State of California to divert at least 75 percent of solid waste generated by the year 2020 in an effort to reduce GHG emissions. It also provides for mandatory commercial and multi-family residential recycling, and requires cities and counties to add a commercial and multi-family residential recycling element to their existing resource reduction plans.

Landfill Methane Capture. On June 25, 2009, CARB approved for adoption regulations for control of methane emissions from municipal solid waste landfills. The regulations will require the installation and proper operation of gas collection and control systems at active, inactive, and closed municipal solid waste landfills having 450,000 tons or greater of waste-in-place and that received waste after January 1, 1977. The regulations contain performance standards for the gas collection and control system, and specify monitoring requirements to ensure that that the system is being maintained and operated in a manner to minimize methane emissions.

1.6.3 REGIONAL

San Joaquin Valley Air Pollution Control District (SJVAPCD)

The SJVAPCD has primary responsibility for the development and implementation of rules and regulations designed to attain the National Ambient Air Quality Standards and California Ambient Air Quality Standards, as well as the permitting of new or modified sources, development of air quality management plans, and adoption and enforcement of air pollution regulations within Kings

County, which is located within the San Joaquin Valley Air Basin. The SJVAPCD regulates most air pollutant sources, except for mobile sources, which are regulated by the CARB or the California EPA. State and local government projects, as well as projects proposed by the private sector, are subject to SJVAPCD requirements if the sources are regulated by the SJVAPCD.

The AB 32 Scoping Plan does not provide an explicit role for local air districts in implementing AB 32, but states that the CARB will work actively with air districts in coordinating emissions reporting, encouraging and coordinating GHG reductions, and providing technical assistance in quantifying reductions. The ability of air districts to control emissions (both criteria pollutants and GHGs) is provided primarily through permitting as well as through their role as CEQA lead or commenting agency, the establishment of CEQA thresholds or guidance documents, and the development of analytical requirements for CEQA documents where SJVAPCD serves as lead agency for CEQA purposes. In December 2009, the SJVAPCD adopted a district policy document titled Addressing GHG Emission Impacts for Stationary Source Projects Under CEQA When Serving as the Lead Agency. It applies to projects for which the SJVAPCD has discretionary approval authority over the project and serves as the lead agency. The policy establishes the process used by SJVAPCD staff to evaluate the significance of project specific GHG emissions impacts for CEQA purposes. Based on the SJVAPCD policy, a project's GHG-related impact is considered to be less than significant pursuant to CEQA if it complies with an adopted statewide, regional, or local plan for reduction of mitigation of GHG emissions, complies with SJVAPCD approved Best Performance Standards, or achieves AB 32 targeted GHG emissions reductions (29%) compared to the business-as-usual scenario (SJVACPD, 2009).

Kings County Association of Governments (KCAG)

KCAG is the local Council of Governments with responsibility for regional planning for Kings County. KCAG's planning efforts address regional issues relating to transportation, land use and urban form, housing, environment, economic development, regional public facilities, and climate change. Plans and programs that KCAG has adopted that support GHG emissions reductions in Kings County are described below.

Kings County Blueprint. KCAG launched an extensive public outreach effort in 2006 to initiate the blueprint planning process as a way to engage the public and key stakeholders in outlining how they would like their communities to grow. From these efforts, KCAG outlined smart growth principles which are based on the public's vision for their communities. In addition to smart growth principles, the blueprint effort also includes a toolkit of resource for planners across the valley to implement smart growth and continues to engage the public in shaping the valley's future.

Greenprint. The Greenprint is an effort to better integrate open space and agricultural preservation into blueprint planning processes. In conjunction with University of California, Davis, the Greenprint will

utilize GIS mapping and other technical resources to better integrate parks, open space, and agricultural lands into land use planning efforts. The Greenprint will complement the open space preservation plan contained in the Kings County 2035 General Plan and provide additional technical resources for planners throughout the valley.

2010 Kings County Regional Bicycle Plan. The 2010 Kings County Regional Bicycle Plan was developed with a focus on integrating land use planning and public health into transportation planning decisions and utilizing performance measures that meet the climate and health concerns of the county. The bicycle plan was designed to accomplish the following goals:

- Provide a well-developed, safe and convenient, interregionally connected system of bikeways complete with support facilities.
- Encourage future public and private development to support and facilitate the expansion, improvement, connectivity, and maintenance of the bikeway system.
- Encourage on-going bicycle safety education and information programs.
- Design bikeways to connect to educational facilities, major employers, residential neighborhoods, and recreational areas.
- Encourage partnerships between private, non-profit, governmental, and citizen's groups.
- Encourage the use of bicycles to enhance air quality and improve the health of the rider.

2011 Regional Transportation Plan (RTP). The 2011 RTP, covering the 25-year period from 2010 to 2035, is a continuation of Kings County's transportation planning process which began in 1975 with the adoption of its first RTP. The RTP is intended to serve many purposes:

- Provide the foundation for transportation decisions by local, regional, and state officials.
- Document the region's mobility needs and issues.
- Identify and attempt to resolve regional issues and provide policy direction for local plans.
- Document the region's goals, policies, and objectives for meeting current and future transportation mobility needs.
- Set forth an action plan to address transportation issues and needs consistent with Regional and state policies.
- Identify transportation improvements in sufficient detail to aid in the development of the State Transportation Improvement Program and to be useful in making decisions related to the development and growth of the region.
- Identify those agencies responsible for implementing the action plans.
- Document the region's financial resources needed to meet mobility needs.

KCAG is in the process of preparing a Sustainable Communities Strategy (SCS) in conjunction with its 2014 RTP. The SCS will detail how the region will reduce GHG emissions from passenger vehicles and light trucks by 5 percent below 2005 levels by 2020 and 10 percent below 2005 levels by 2035 to State-mandated levels, pursuant to SB 375 (refer to the discussion of SB 375 in Section 1.6.2 above).

2008 Transit Development Plan. The purpose of the 2008 Transit Development Plan was to update the overall scope and intent of the "2003 Kings County Transit Development Plan" by providing a coordinated planning link between past recommendations for service improvements and future transit needs. The plan serves as the "blueprint" for transit planning for the two public transit providers in Kings County (Kings Area Rural Transit (KART) and Corcoran Area Transit) through the year 2013 and provides a comprehensive view of public transit operations in Kings County.

1.6.4 LOCAL GOVERNMENT ROLES AND RESPONSIBILITIES

The AB 32 Scoping Plan establishes a framework for achieving statewide GHG reductions required by AB 32. Specifically, it describes a list of measures that the State will undertake, and the anticipated GHG reductions associated by these measures by 2020. Because the State does not have jurisdictional control over all of the activities that produce GHG emissions in California, the AB 32 Scoping Plan articulates a unique role for local governments by identifying them as essential partners in achieving the State's GHG reduction goals. The AB 32 Scoping Plan states that local governments "have broad influence and, in some cases, exclusive authority over activities that contribute to significant direct and indirect GHG emissions through their planning and permitting processes, local ordinances, outreach and education efforts, and municipal operations". In addition, many of the plan's proposed measures to reduce GHG emissions rely on local government actions. Based on this role, the AB 32 Scoping Plan recommends that local governments reduce GHG emissions from both their municipal operations and community at large by 15 percent from baseline levels by 2020 to parallel the State's target.

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CHAPTER 2

GHG EMISSIONS AND REDUCTION TARGET

2.0 GHG Emissions and Reduction Target

A GHG emissions inventory identifies the major sources and quantities of GHG emissions produced by community-wide and local government activities within a jurisdiction's boundaries for a given year. Estimating GHG emissions enables local governments to establish an emissions baseline, track emissions trends, identify the greatest sources of GHG emissions within their jurisdiction, set targets for emissions reductions, and create an informed mitigation strategy based on this information.

This chapter summarizes the results of the Kings County Community-wide GHG Emissions Inventory, including a 2005 baseline inventory and 2020 business-as-usual forecast, prepared by the SJVAPCD in April 2013 (refer to **Appendix A** for the complete report and supporting documentation). This chapter also includes and an adjusted forecast that accounts for reductions from State measures and quantifies the GHG reduction target for this CAP, consistent with AB 32.

2.1 2005 Baseline GHG Emissions

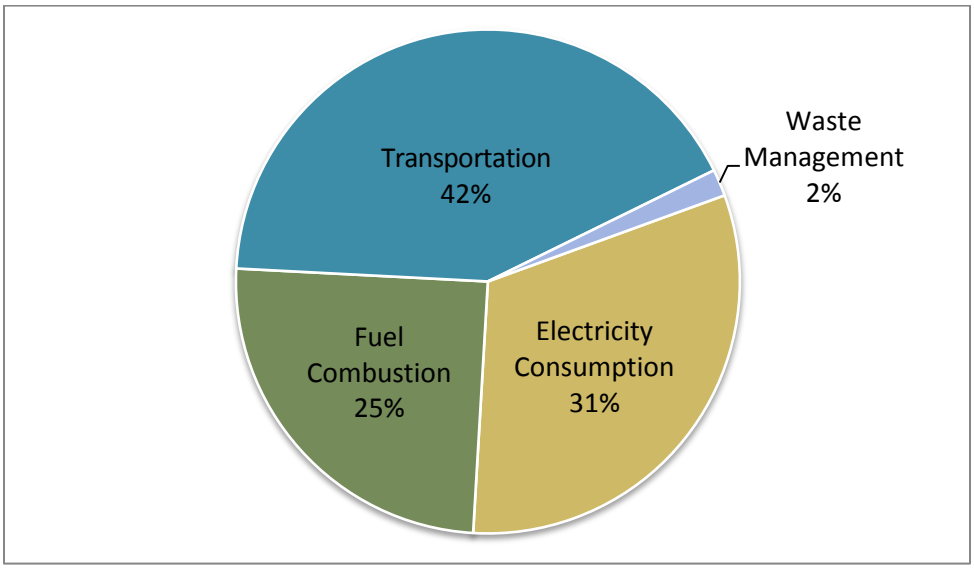
2.1.1 METHODOLOGY

The baseline inventory quantified the GHG emissions that occurred within the Kings County geographic boundary in the year 2005. Therefore, the inventory contained in **Appendix A** includes all sources within the region, including those on State and Federal lands. However, since the CAP is intended to be implemented by local government agencies, this CAP accounts for and addresses only those emissions sources over which the local agencies have some degree of influence (ownership, operational control, regulatory authority, enforcement, budgetary, or through education and outreach), consistent with State-recommended GHG inventory protocol. The U.S. Community Protocol for Accounting and Reporting of GHG Emissions (Protocol) (2012) provides guidelines for determining the appropriate scope for the intent of the inventory. Based on Protocol guidance, several sources were removed from the CAP's 2005 baseline and 2020 forecast; however, the emissions for these sources are still provided in the comprehensive GHG Emissions Inventory report for informational purposes. Refer to **Appendix A** for relevant information and documentation regarding the excluded emissions sources.

2.1.2 2005 EMISSIONS

In 2005, the region emitted approximately 1,139,135 metric tons of carbon dioxide equivalent GHG emissions (MT CO_2e), as a result of the following categories of activities: electricity consumption in residential, commercial, and industrial buildings; residential, commercial, and industrial fuel (i.e., natural gas) combustion, transportation,[1] and waste management. As shown in **Figure 2-1** and **Table 2-1** the largest sources of GHG emissions were transportation (42 percent), electricity consumption (31 percent), and fuel combustion (25 percent). The remainder of emissions resulted from waste management (2 percent).

Figure 2-1: Regional GHG Emissions by Source (2005)



In 2005, a number of sources or activities also sequestered or captured GHGs, including commercial composting, resource recovery, and urban forests.[2] Together these sources sequestered 92,331 MT CO_2e in 2005. As shown in **Table 2-1** below, taking into account the amount of carbon sequestered county-wide, the region's net total GHG emissions were 1,046,804 MT CO_2e in 2005.

[1] Transportation emissions are the result of diesel, gasoline, compressed natural gas, and liquid petroleum gas fuel used in on- and off-road vehicles. Transportation emissions exclude pass-through vehicle trips that do not have an origin or destination within the region. Emissions take into account the regional mix of vehicle classes and model years, as well as ambient conditions and travel speeds that determine fuel efficiency. Emissions resulting from airports and rail are not included in the transportation source category of this CAP because they are operated as part of a larger statewide system and beyond local government's ability to influence. Refer to **Appendix A** for further information.

[2] Carbon sequestration is the process by which atmospheric carbon dioxide is removed from the atmosphere and stored or deposited in a reservoir.

Table 2-1: Region-wide GHG Emissions by Source (2005)

Source	Sub-source	2005 GHG Emissions (MT CO_2e)	
Gross Regional Emissions			**1,139,135**
Electricity Consumption	Electricity Consumption	358,694	358,694
Fuel Combustion	Residential	86,529	283,536
	Commercial	65,887	
	Industrial	131,120	
Transportation	On-Road Vehicles	470,435	477,343
	Off-Road Vehicles	6,635	
	Marine vessels/water craft	273	
Waste Management	Landfills	11,394	19,562
	Wastewater Management	8,168	
Total Regional Sequestration			**-92,331**
Other Sources	Composting (Commercial)	-54,747	-92,331
	Resource Recovery	-25,141	
	Urban Forests	-12,443	
Net Regional Emissions			**1,046,804**

2.2 2020 Forecast

2.2.1 METHODOLOGY

The GHG emissions forecast is a projection of how GHG emissions would change in the future based on projected changes in population, jobs, and vehicle miles traveled. The forecast provides a "business-as-usual" estimate, or scenario, of how emissions will change in the year 2020 if consumption trends and behavior continue as they did in 2005. The year 2020, which was used as the forecast year, reflects the target year in AB 32. With the exception of the on-road vehicle transportation and waste management categories, the business-as-usual forecast does not account for reductions in GHG emissions that are anticipated to occur as a result of several State measures, including the Renewable Portfolio Standard, Advanced Clean Cars, and Title 24 Building Energy Efficiency Standards.[3]

[3] The 2020 business-as-usual forecast of on-road vehicle emissions accounted for the Low Carbon Fuel Standard and Pavley I clean car standard using CARB's ONROAD (2011) software. In addition, the 2020 business-as-usual forecast for waste management accounted for Landfill Methane Capture. Since the forecast accounts for the reductions from some State measures that will have known reductions, it is not a true "business-as-usual" forecast. However, it is referred to as such herein for comparison with the adjusted forecast which accounts for reductions from the Renewable Portfolio Standard, the Title 24 Building Energy Efficiency Standard, and Advanced Clean Cars.

The 2020 GHG emissions forecast was developed by applying a specific growth factor to each of the 2005 base year estimates. A growth factor is a means by which a known value can be projected forward to a given year based on a given indicator, such as population, the number of jobs in a given sector, or other factors. During the methodology development process each source of emissions was evaluated to determine the appropriate growth activity data to be used to develop the 2020 forecasted GHG emission inventory. The two primary indicators used to forecast GHG emissions were population and commercial and industrial sector employment. Kings County population was obtained from two sources. The growth activity data for 2005- 2010 was obtained from the California Department of Finance. For years 2015-2050, growth activity data was obtained from the San Joaquin Valley Demographic Forecasts 2010 to 2050. Baseline (2005) commercial and industrial sector employment figures were obtained from the U.S. Census Bureau. Forecast (2020) commercial and industrial sector employment figures were provided by KCAG (SJVAPCD, 2013). **Table 2-2** shows the growth projections used to determine the emissions growth for each source of emissions in 2020. Forecast for each sub-source are detailed in the GHG Emissions Inventory report, located in **Appendix A**.

Table 2-2: Regional Growth Projections

Forecast Data	2005	2020	Percent Change	GHG Emissions Source Applied to
Population	144,601	181,000	25%	Electricity, Residential Combustion, Transportation, Waste Management, Other Sources
Commercial and Industrial Employment	12,800	16,543	29%	Commercial and Industrial Combustion

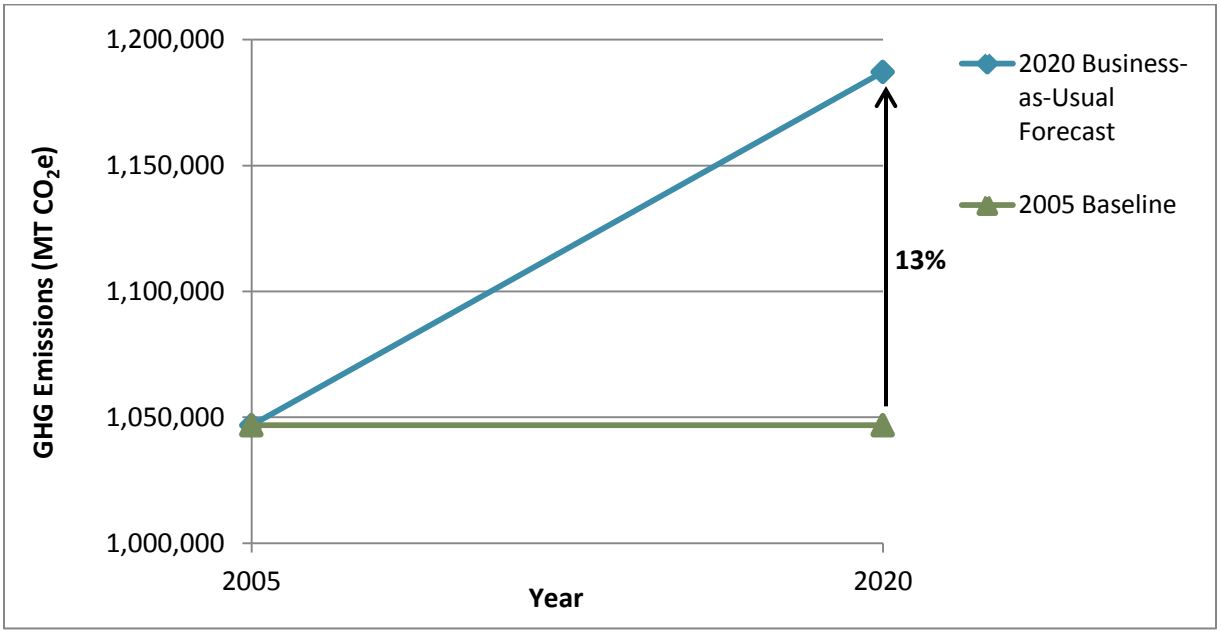
2.2.2 BUSINESS-AS-USUAL FORECAST

Under the business-as-usual forecast scenario, the region's GHG emissions are projected to grow by approximately 13 percent by the year 2020, from 1,046,804 MT CO_2e to 1,187,184 MT CO_2e. Emissions associated with waste management are projected to experience the highest level of growth (29 percent). This level of growth projected in the waste management category is a result of waste placement projections provided by Kings County Waste Management District, which were used in the projection of 2020 landfill emissions. In addition, due to the methodology used to forecast on-road vehicle emissions, which as previously stated accounts for reductions from Low Carbon Fuel Standard and Pavley I, the on-road vehicle emissions source would exhibit higher growth than shown below in a true business-as-usual forecast, absent reductions from State measures. **Table 2-3** and **Figure 2-2** show the results of the business-as-usual forecast scenario.

Table 2-3: 2020 Business-As-Usual GHG Emissions Forecast

Source	2005 (MT CO_2e)	2020 (MT CO_2e)	Percent Change from 2005 to 2020
Electricity Consumption	358,694	448,985	25%
Fuel Combustion	283,536	356,616	26%
Transportation	477,343	471,934	-1%
Waste Management	19,562	25,221	29%
Other Sources (Sequestration)	-92,331	-115,572	25%
TOTAL	**1,046,804**	**1,187,184**	**13%**

Figure 2-2: 2020 Business-As-Usual GHG Emissions Forecast



2.2.3 ADJUSTED FORECAST

In addition to the Low Carbon Fuel Standard, Pavley I, and Landfill Methane Control Measures, which are already accounted for in the business-as-usual forecast, the AB 32 Scoping Plan identifies several additional State measures that have been approved, programmed, and/or adopted since the 2005 base year that would reduce GHG emissions within the region including the Renewable Portfolio Standard, the Title 24 Building Energy Efficiency Standard, and Advanced Clean Cars. These measures require no additional local action and were therefore incorporated into the adjusted forecast scenario. A brief description of each of these State measures is provided below and **Table 2-4** summarizes the reduction that will result from these measures in 2020. Under the adjusted scenario, GHG emissions are projected to decrease approximately 16 percent below the business-as-usual scenario to 1,000,342 MT CO_2e in 2020. This is four percent lower than the 2005 baseline emissions level of 1,046,804 MT CO_2e.

Table 2-4: Summary of State Reductions and 2020 Adjusted Forecast

State Measure	2020 Reduction (MT CO_2e)*
Advanced Clean Cars	-7,431
Title 24	-17,127
Renewable Portfolio Standard	-162,284
Total Reduction from State Measures	**-186,842**
2020 Adjusted Forecast	**1,000,342**

*Refer to **Appendix B** for calculation details

Advanced Clean Cars

In January 2012, CARB approved a new emissions-control program combining the control of smog, soot causing pollutants, and GHG emissions into a single coordinated package of requirements for passenger cars and light trucks model years 2017 through 2025. The Advanced Clean Cars program coordinates the goals of the Low Emissions Vehicles, Zero Emissions Vehicles, and Clean Fuels Outlet programs and would reduce GHG emissions by three percent from 2008 levels by 2020.

Reductions in GHG emissions from the Advanced Clean Cars program were calculated by taking a three percent reduction from 2008 on-road transportation emissions from light-duty vehicles in 2020. As shown in **Table 2-4**, the Advanced Clean Cars program would reduce emissions by approximately 7,431 MT CO_2e in 2020.

Title 24

Although it was not originally intended specifically to reduce GHG emissions, California Code of Regulations Title 24, Part 6: California's Energy Efficiency Standards for Residential and Nonresidential Buildings, was first adopted in 1978 in response to a legislative mandate to reduce California's energy consumption, which in turn reduces fossil fuel consumption and associated GHG emissions. The standards are updated periodically to allow consideration and possible incorporation of new energy-efficient technologies and methods. The updates that have occurred since the 2005 baseline year that were not accounted for in the business-as-usual forecast include the 2008 and 2013 Title 24 Energy Efficiency Building Standards. The California Energy Commission estimates that the 2008 standards reduce energy consumption by 10 percent in residential buildings and five percent in nonresidential buildings, relative to the previous standards. For projects implemented after January 1, 2014, the California Energy Commission estimates that the 2013 standards will reduce consumption by 25 percent in residential buildings and 30 percent in nonresidential buildings, relative to the 2008 standards. These percentage savings are applicable to heating, cooling, lighting, and water heating only and do not include other appliances, outdoor lighting that is not attached to buildings, plug loads,

or other energy uses. Therefore, these percentage savings were applied to the percentage of energy use covered by Title 24.[4]

The calculations and 2020 GHG emissions forecast assume that all growth in the residential, commercial, and industrial sectors is from new construction. As shown in **Table 2-4,** the 2008 and 2013 Title 24 standards would reduce emissions by approximately 17,127 MT CO_2e in 2020.

The AB 32 Scoping Plan calls for the continuation of ongoing triennial updates to Title 24 that will yield regular increases in the mandatory energy and water savings for new construction. Future updates to Title 24 Energy Efficiency Building Standards are not taken into consideration due to lack of data and certainty about the magnitude of energy savings that will be realized with each subsequent update.

Renewable Portfolio Standard

The State of California Renewable Portfolio Standard requires investor-owned utilities, electric service providers, and community choice aggregators to increase the portion of energy that comes from renewable sources to 20 percent by 2010 and 33 percent by 2020. Pacific Gas and Electric Company (PG&E) and Southern California Edison (SCE) are the electricity providers in Kings County. In order to account for the reduction in emissions that will result from the Renewable Portfolio Standard, 2020 emissions factors were applied to the regional projected electricity usage.[5] As shown in **Table 2-4,** the Renewable Portfolio Standard would reduce regional GHG emissions by approximately 162,284 MT CO_2e in 2020.

2.3 GHG Emissions Reduction Target

The AB 32 Scoping Plan encourages local governments to establish a GHG reduction target that "parallels the State's commitment to reduce GHG emissions by approximately 15 percent from current levels by 2020." Therefore, this CAP establishes a reduction target to achieve emissions levels 15 percent below 2005 baseline levels by 2020 consistent with the AB 32 Scoping Plan.

Based on the 15 percent reduction target, the region would need to emit no more than 889,783 MT CO_2e in 2020. As shown in **Table 2-5** and **Figure 2-3,** to meet this target, the region will need to reduce its GHG emissions 11 percent (or 110,559 MT CO_2e) below the adjusted forecast by 2020 through implementation of measures and actions that are identified in Chapter 3 of this CAP.

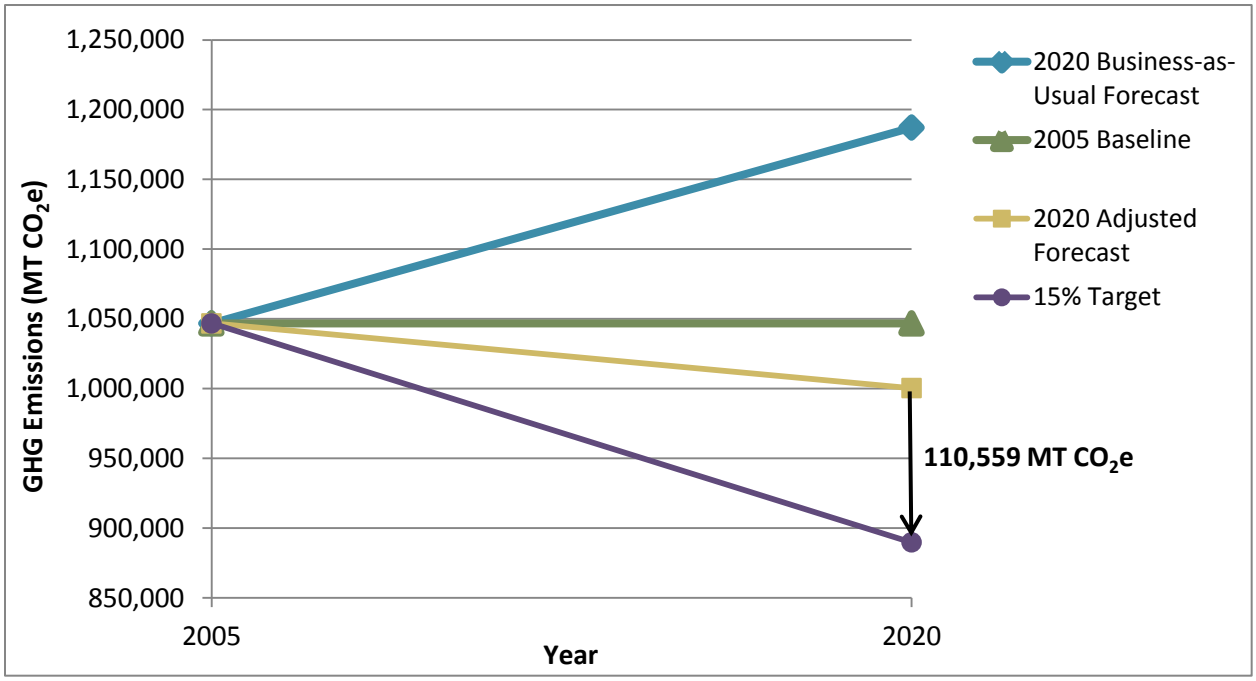
[4] Reductions for the 2008 standards are provided in the California Energy Commission's Impact Analysis, 2008 Update to the California Energy Efficiency Standards for Residential and Nonresidential Buildings (2007). This calculation follows the methodology detailed in the Statewide Energy Efficiency Collaborative's report, Greenhouse Gas Forecasting Assistant (October 2011).

[5] PG&E and SCE emissions factors were retrieved from the Statewide Energy Efficiency Collaborative's report, Greenhouse Gas Forecasting Assistant (October 2011).

Table 2-5: GHG Emissions, Target, and Reduction Necessary to Meet Target

	GHG Emissions (MT CO_2e)
2005 Baseline Emissions	1,046,804
2020 Adjusted Forecast	1,000,342
Target (15% below 2005 levels by 2020)	889,783
Total Reduction from 2020 Adjusted Forecast Necessary to Meet Target	**110,559**

Figure 2-3: Regional Emissions, Target, and Reduction Necessary to Meet Target



The 15 percent reduction target is also presented herein on a per "service population" (residents plus employees) basis to allow each jurisdiction to determine its share of the regional target. The service population (SP) target was derived by dividing the region's targeted emissions levels for 2020 by the region's 2020 service population.[6] As shown in **Table 2-6** and **Figure 2-4**, using the service population metric, the region's GHG emissions would be 4.53 MT CO_2e/SP in 2020. As such, the region would need to reduce its GHG emissions to 4.03 MT CO_2e/SP by 2020. To meet this target, the region will need to reduce its GHG emissions by 0.5 MTCO_2e/SP by 2020 through implementation of local and/or regional measures and actions.

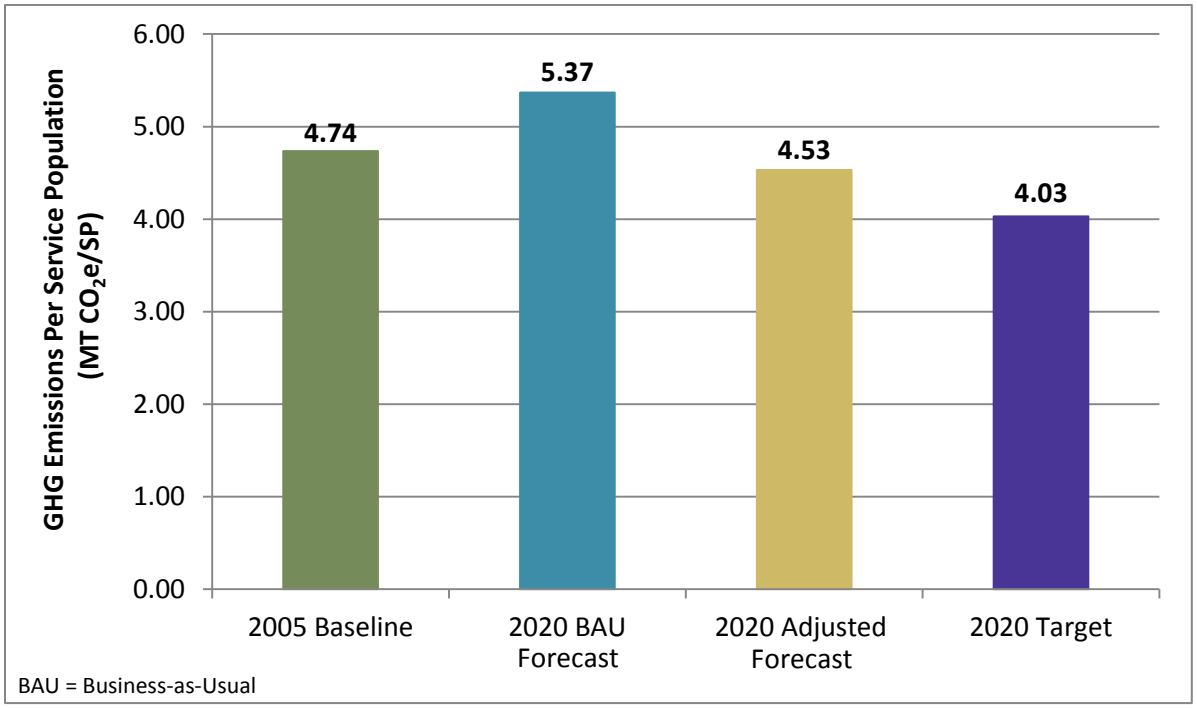
[6] The population and employment assumptions used to calculate the regional service population target were updated with more accurate baseline data, and therefore differ from the estimates used in the inventory forecast. Growth rates used to calculate the regional service population were maintained consistent with the inventory forecast.

Table 2-6: Service Population Target

GHG Emissions Target (MT CO_2e)	889,783
Projected Population[1]	179,756
Projected Employment[1]	41,257
Projected Service Population (population + employment)	221,013
Service Population Target (MT CO_2e/SP)	**4.03**

[1] Projected population and employment estimates were calculated by applying the growth factors used in the regional inventory (see **Table 2-2** above) to updated 2005 data. 2005 population data was obtained from the California Department of Finance (2012) and 2005 employment data was obtained from the U.S. Census Bureau's OnTheMap tool (2013).

Figure 2-4: Per Service Population Emissions, Target, and Reduction Necessary to Meet Target



BAU = Business-as-Usual

CHAPTER 3

GHG REDUCTION MEASURES

3.0 GHG Reduction Measures

This chapter identifies the measures and implementation actions that the participating jurisdictions will implement to achieve the GHG emissions reduction target of 15 percent below 2005 levels by 2020, consistent with AB 32. The GHG reduction measures and actions incorporate and/or build on many of the policies and implementation programs identified in the local jurisdictions' General Plans, and are also consistent with a number of other policy and guidance documents, including the Kings County Blueprint (2011), Kings County Smart Growth Principles (2008), and Kings Regional Bicycle Plan (2011), and Transit Development Plan (2008). The measures and actions were identified based on consideration of the reductions needed to achieve the target, the sources and distribution of emissions revealed in the GHG emissions inventory, existing priorities and resources, and the potential costs and benefits of each measure. GHG reduction measures and actions were developed that simultaneously address multiple local concerns including constrained budgets, limited water supplies, job creation, social equity, and energy security.

The implementation actions in this chapter apply to the region as a whole. As such, not every action listed will be appropriate for implementation in every jurisdiction. It is the discretion of each jurisdiction to decide whether and how to best implement the various actions listed in this plan. For example, a measure could be implemented through local government planning and permitting processes, local ordinances, outreach and education efforts, municipal operations, etc. For many actions to be successful, implementation will require partnerships among representatives of regional and local governments, utilities, agencies, organizations, residents of, and businesses in the Kings County region.

If a participating jurisdiction wishes to use the CAP for tiering and streamlining the analysis of GHG emissions for future projects under CEQA, the jurisdiction must demonstrate effective implementation of applicable GHG reduction measures to achieve the jurisdiction's 4.03 MT CO_2e /SP target, consistent with AB 32, as well as adherence to all requirements pursuant to Section 15183.5 of the CEQA Guideline (refer to Chapter 1, Section 1.4, *Relationship to CEQA*, for a list of CEQA Guidelines requirements). As future projects come forward for environmental review, the applicant would have the option to either quantify GHG emissions resulting from the project to demonstrate the project is below CEQA thresholds, or may avoid quantifying GHG emissions by demonstrating that the project is consistent with the CAP. Consistency with the CAP may be demonstrated by incorporating applicable GHG reduction measures as project components or mitigation.

3.1 Chapter Organization

The GHG reduction measures are organized into five focus areas that represent the primary ways in which the region will reduce GHG emissions. Each focus area begins with an introduction, followed by a summary table listing the measures within the focus area and the associated GHG reduction potential,

where applicable. Following the introduction to each focus area, the chapter presents each measure with the following information:

- **Implementation Actions:** the specific steps the participating jurisdiction will take to achieve the measure performance criteria. Actions apply to either the community or local agency, as identified in parenthesis following each action. Actions may be implemented individually by the participating jurisdictions or may be more efficiently implemented through regional collaboration.
- **Performance Criteria:** the outcome necessary to achieve the measure's GHG emissions reduction potential by 2020. Performance criteria were developed based on a review of existing local jurisdictions actions since 2005, as well as assumptions made about the degree of implementation in the year 2020. Performance criteria were reviewed by local jurisdiction staff and the Advisory Committee to ensure that assumptions were appropriate for the region and achievable within the implementation time frame (see Chapter 4).
- **GHG Reduction Potential:** the estimated reduction in emissions anticipated in 2020. Reductions are presented as a regional total as well as by service population (SP). Supporting information pertaining to the GHG reduction calculations is provided in **Appendix B**.
- **Costs and Savings:** for each measure, potential costs and savings to the individual jurisdiction or community (private) are categorized as none, low, medium, or high. These categories correspond to a range, as shown in **Table 3-1**, as costs for each measure are highly variable based on the jurisdiction's current degree of implementation and the amount of funding and/or incentives received. In addition, implementing measures through regional collaboration will lower costs incurred by individual jurisdictions. Costs account for the expense that would occur beyond conducting business-as-usual (i.e., without implementation of the CAP). Supporting information is provided in **Appendix C**.

Table 3-1: Measure Costs and Savings

Aggregated Local Agency Cost/Savings		Per-Unit Annual Private Cost/Savings	
None:	$0	None:	$0
Low:	$1 - $25,000	Low:	$1 - $2,500
Medium:	$25,001 - $50,000	Medium:	$2,501 - $5,000
High:	$50,001 or greater	High:	$5,001 or greater

3.2 Energy Measures

Energy use accounted for 56 percent of the region's total GHG emissions in 2005.[1] These emissions result from the combustion of fossil fuels, primarily coal, oil, and natural gas, which is used to heat, cool, and provide power to residential, commercial, and industrial buildings and other facilities. Factors affecting energy-related emissions in buildings include building design and the efficiency of technology and electronics in buildings.

GHG emissions reductions can be achieved by changes to both energy demand (e.g., improving energy efficiency and reducing consumption) and energy supply (e.g., switching from a high-carbon to a low- or zero-carbon technology or fuel). The energy measures listed in **Table 3-2** focus on these strategies and have the potential to reduce the region's GHG emissions by 47,641 MT CO_2e (or 0.2156 MT CO_2e/SP) by 2020. In addition to reducing GHG emissions, implementation of the energy measures described in this section have the potential to provide other important benefits to the community. These benefits include:

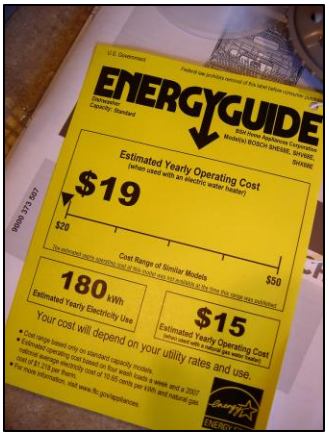
- Reduced energy and operating costs
- Lower maintenance costs and extended equipment lives
- Increased building re-sale value
- Strengthened local economy
- Resource conservation
- Increased electricity reliability
- Improved air quality

Table 3-2: Energy GHG Reductions by Measure

Measure Number	Measure	2020 GHG Reductions (MT CO_2e)	
		Regional	SP
E-1	Energy Efficiency and Conservation	6,054	0.0274
E-2	Energy Audit and Retrofit Program	12,524	0.0567
E-3	Income-Qualified Energy Efficient Weatherization	6,730	0.0305
E-4	On-Site Small Scale Solar Energy	10,617	0.0480
E-5	Incentives for Exceeding Title 24 Building Standards	11,716	0.0530
Energy Total		**47,641**	**0.2156**

[1] Energy use generally refers to both the electricity consumption and fuel combustion sectors in Chapter 2.

E-1: Energy Efficiency Outreach and Conservation



Increase energy efficiency and conservation.

Implementation Actions:

E-1.1 Work with local electricity and natural gas utility provider(s) to promote use of utility financial incentives to improve energy efficiency, such as by using on-bill financing, rebates and tax credits, and demand management programs. (Community)

E-1.2 Participate/continue to participate in the San Joaquin Valley Clean Energy Organization's (SJVCEO) Valley Innovative Energy Watch (VIEW) Partnership and/or PG&E's Energy Watch partnership program to increase community awareness and support of the California Long Term Energy Efficiency Strategic Plan through education, marketing, and outreach. (Community)

E-1.3 Conduct additional outreach and promotional activities, either individually or in collaboration with local electricity and natural gas utility provider(s) and/or local businesses and organizations (e.g., SJVCEO), targeting specific groups within the community (e.g., homeowners, renters, businesses, income-qualified households, etc.). (Community)

E-1.4 Collaborate with local agencies and work with local electricity and natural gas utility provider(s) to hold an educational workshop regarding measures that individuals can take to reduce energy usage. (Community)

E-1.5 Work with the Kings County Office of Education, local school districts, and the SJVAPCD to provide information to students regarding energy efficiency and conservation, and the environmental impact of energy use on the community as a whole. (Community)

E-1.6 Track energy efficiency and conservation related rebate and incentive programs and provide this information to public and private sector partners through the local jurisdiction's website, e-mail distribution lists, newsletters, social media, and other outreach opportunities, as feasible. (Community)

Performance Criteria	GHG Reduction		Local Agency		Community	
	Regional	SP	Cost	Savings	Cost	Savings
30% of households and 35% of non-residential building owners participate in an incentive program with an average energy savings of 5% per household and 7% per non-residential building	6,054	0.0274	Medium	None	None	Varies

E-2: Energy Audit and Retrofit Program

Facilitate voluntary energy assessments, retrofits, and retrocommissioning of existing residential and non-residential buildings and public lighting.[2]

Implementation Actions:

E-2.1 Collaborate with local electricity and natural gas utility provider(s) and local businesses and organizations (e.g., SJVCEO) to promote voluntary residential and non-residential energy assessment programs and upgrade packages that leverage existing rebates, such as Direct Install Programs. (Community)

E-2.2 Work with local electricity and natural gas utility provider(s) and local businesses and organizations (e.g., SJVCEO) to conduct additional outreach and promotional activities targeting specific groups (e.g., owners of buildings built prior to Title 24, income-qualified households, etc.). (Community)

E-2.3 Participate in and promote a residential and commercial energy efficiency financing program (e.g., through a Property Assessed Clean Energy [PACE] program, CaliforniaFIRST, a joint powers authority with other local agencies, or other mechanisms) allowing residential and commercial property owners to voluntarily invest in energy efficiency upgrades for their buildings. (Community)

E-2.4 Work with local electricity and natural gas utility provider(s) to access technical assistance and financial incentives, such as facility audits, rebates, on-bill financing, loans, grants, and savings-by-design programs. (Local Agency)

E-2.5 Continue to identify and replace inefficient local agency-owned or -operated public lighting in parking lots, streets, and other public areas. (Local Agency)

Performance Criteria	GHG Reduction		Local Agency		Community	
	Regional	SP	Cost	Savings	Cost	Savings
25% of households and non-residential buildings audited. Assumes 40% of buildings audited will result in energy efficiency improvements that on average result in 20% energy savings.	12,524	0.0567	Low to Medium	Varies	None	Varies

[2] Retrocommissioning is a systematic process for identifying less-than-optimal performance in a facility's equipment, lighting and control systems and making the necessary adjustments. While retrofitting involves replacing outdated equipment, retrocommissioning focuses on improving the efficiency of what's already in place.

E-3: Income-Qualified Energy Efficient Weatherization

Facilitate energy efficient weatherization of low- and middle-income housing.

Implementation Actions:

E-3.1 Promote/continue to promote income-qualified weatherization programs (e.g., Energy Upgrade California), either individually, or in collaboration with an existing organization, to income-qualified households using sources of data available to the local agency, (e.g., water bills, housing records, etc.). (Community)

E-3.2 Work with local electricity and natural gas utility provider(s), SJVCEO VIEW Partnership, Kings Community Action Organization, and/or Self-Help Enterprises to provide weatherization assistance through income-qualified weatherization programs, such as Direct Install Programs. (Community)

Performance Criteria	GHG Reduction		Local Agency		Community	
	Regional	SP	Cost	Savings	Cost	Savings
10% of low- and middle-income residential units upgraded with an average energy savings of 35%	6,730	0.0305	Low to Medium	None	None	Low

E-4: On-Site Small-Scale Solar Energy

Facilitate the installation and use of on-site small-scale solar photovoltaic (PV) systems and solar hot water heaters in households and businesses.

Implementation Actions:

E-4.1 Encourage local homebuilders to participate in the New Solar Homes Partnership to install solar PV systems on qualifying new homes. (Community)

E-4.2 Work with the building industry to incorporate designs improving solar readiness into building plans through voluntary green building guidelines. (Community)

E-4.3 Provide a link to solar PV rebate and incentive programs, including the Single Family Affordable Solar Homes (SASH) Program and the Multifamily Affordable Solar Homes (MASH) Program, on the local jurisdiction's website, as feasible. (Community)

E-4.4 Improve the permit review and approval process for small (under 10 kW) solar PV systems by implementing recommendations for streamlined permitting identified in the California Solar Permitting Guidebook (e.g., use standardized forms, provide clear written instructions on the permitting process and a checklist of required application materials, make information available on the local agency's website and at the permit counter, etc.). (Community)

E-4.5 Participate in and promote a residential and commercial renewable energy financing program (e.g., through a PACE program, CaliforniaFIRST, a joint powers authority with other local agencies, or other mechanisms) allowing residential and commercial property owners to voluntarily invest in renewable energy systems for their buildings. (Community)

E-4.6 Identify and secure funding (e.g., through grants, on-bill financing, loans, energy performance contracts, lease-purchase agreements, or other mechanisms) to install solar PV systems at municipal properties and facilities, where feasible. (Local Agency)

Performance Criteria	GHG Reduction		Local Agency		Community	
	Regional	SP	Cost	Savings	Cost	Savings
10% of households install solar PV systems (average of 6 kW per system) and 5% of households install solar water heaters by 2020. 1 non-residential solar PV installation (average of 6 kW per system) per 50 employees and 1 solar water heater installation per 100 employees	10,617	0.048	Medium to High	Low	None	Varies

E-5: Incentives for Exceeding Title 24 Building Standards

Provide incentives to projects that voluntarily exceed State energy efficiency standards.

Implementation Actions:

E-5.1 Provide support to and recognition of developers proposing projects that voluntarily exceed Title 24 Energy Efficiency Building Standards, meet the state's Green Building Standards voluntary tier levels, or are LEED, Greenpoint, or ENERGY STAR rated. (Community)

E-5.2 Provide project applicants with green building resources, including the SJVAPCD's Best Performance Standards list for GHG reductions, and promote workshops offered by community organizations. (Community)

E-5.3 Encourage through education and/or incentives energy efficient development design such as, provisions for solar access, building siting to maximize natural heating and cooling, and landscaping to aid passive cooling. (Community)

Performance Criteria	GHG Reduction		Local Agency		Community	
	Regional	SP	Cost	Savings	Cost	Savings
20% of new or remodeled residences and non-residential buildings exceed 2013 Title 24 energy efficiency standards by 20%	11,716	0.0530	Low to Medium	None	None	Varies

3.3 Transportation and Land Use Measures

Transportation-related emissions make up 42 percent of the region's GHG emissions. Factors affecting GHG emission from transportation include the number of vehicle miles traveled (VMT), fuel economy of vehicles, and the type of fuel used. The number of VMT is directly influenced by the geographic distribution of people and places, especially the density of development. Therefore, land use measures are included as reduction measures in this section.

The measures in this section focus on reducing GHG emissions by reducing VMT, improving fuel economy, and encouraging a switch to low carbon/alternative fuels. The transportation and land use measures listed in **Table 3-3** focus on these strategies and have the potential to reduce the region's GHG emissions by 66,088 MT CO_2e (or 0.299 MT CO_2e/SP) by 2020. The transportation and land use measures in this section will not only help reduce GHG emissions, but will also provide multiple benefits to the community. These include:

- Reduced transportation costs
- Reduced noise, air, and water pollution
- Reduced traffic congestion
- Improved public health
- Strengthened local economy
- Improved infrastructure
- Increased equity
- Increased community interaction
- Increased housing and travel options
- Resource conservation

Table 3-3: Transportation and Land Use GHG Reduction Measures

Measure Number	Measure	2020 GHG Reductions (MT CO_2e)	
		Regional	SP
TL-1	Infill and Mixed-Use Development	6,139	0.0278
TL-2	Bicycle and Pedestrian Environment	15	0.0001
TL-3	Expand Transit Network	44	0.0002
TL-4	Employer-Based Transportation Demand Management (TDM)	10,121	0.0458
TL-5	Parking Supply Management	8,301	0.0375
TL-6	Electric Vehicle Readiness	12,494	0.0565
TL-7	Low Carbon/Alternative Fuel Vehicles	24,156	0.1093
TL-8	Traffic Flow and Light-Duty Passenger Vehicle Idling	4,818	0.0218
Transportation and Land Use Total		**66,088**	**0.2990**

TL-1: Infill and Mixed-Use Development[3]

Facilitate mixed-use, higher density, and infill development near transit stops, in existing community centers/ downtown, and in other designated areas.

Implementation Actions:

TL-1.1 Support and encourage mixed-use and medium- and high-density land use categories located within ¼ mile of a transit stop, park and ride facility, or existing developed areas, by allowing flexible zoning and/or density bonuses for applicable projects.[4] (Community)

TL-1.2 Prioritize infill development by publicly providing the location and zoning of infill sites on the local jurisdiction's website and working with developers to expedite applications. (Community)

TL-1.3 Allow live/work developments that permit residents to live at their place of work and thereby reduce VMT and associated GHG emissions. (Community)

TL-1.4 Through the development review process, evaluate development projects based on consistency with applicable general plan policies, zoning regulations, and design guidelines, including the Kings County Smart Growth Principles and Kings County and San Joaquin Valley Blueprint. (Community)

TL-1.5 Work with KCAG in the updates to the Kings County Blueprint to direct future growth to existing urbanized areas through implementation of smart growth principles and use of toolkit resources identified in the Blueprint. (Community)

TL-1.6 Showcase infill and mixed-use projects on the local jurisdiction's website and in newsletters, etc., as feasible. (Community)

[3] Mixed-use development integrates a mixture of commercial, residential, and office type uses that are often segregated into separate land use areas. Infill development is defined as new development that is sited on vacant or undeveloped land within an existing community, and that is enclosed by other types of development (Sustainable Cities Initiative, 2013).

[4] Medium- and high-density land use categories generally establish urban densities between seven and 24+ dwelling units per acre, resulting in population densities ranging from approximately 22.5 to 77 persons per acre. Densities by land use category may vary by jurisdiction.

Performance Criteria	GHG Reduction		Local Agency		Community	
	Regional	SP	Cost	Savings	Cost	Savings
20% shift of net new growth to within a quarter mile of transit stops or existing developed areas	6,139	0.0278	Low to Medium	None	None	Varies

TL-2: Bicycle and Pedestrian Environment

Continue to expand and improve the bicycle and pedestrian network.

Implementation Actions:

TL-2.1 Continue to pursue public and private funding to expand and link the regional bicycle and pedestrian network in accordance with the local jurisdiction's general plan and bicycle plan, and the Regional Bicycle Plan/Regional Active Transportation Plan. (Community)

TL-2.2 Incorporate multi-modal improvements into pavement resurfacing, restriping, and signalization operations where safety and convenience of users can be improved within the scope of work. (Community)

TL-2.3 Establish minimum design criteria for bicycle and pedestrian circulation and implement through the design review process. (Community)

TL-2.4 Encourage the installation of adequate and secure bicycle parking at all multi-family residential, commercial, governmental, and recreational locations throughout the region. (Community)

TL-2.5 Support land use planning that will promote pedestrian and bicyclist access to and from new development by encouraging land use and subdivision designs that provide safe bicycle and pedestrian circulation, including bicycle parking facilities and internal bicycle and pedestrian routes, where feasible. (Community)

TL-2.6 Collaborate/continue to collaborate with law enforcement, school officials, and private organizations to encourage school and/or public bicycle safety programs. (Community)

Performance Criteria	GHG Reduction		Local Agency		Community	
	Regional	SP	Cost	Savings	Cost	Savings
0.2% increase in walking/bicycling trips in incorporated areas and 0.1% increase in walking/bicycling trips in unincorporated areas	15	0.0001	Low	None	None	Varies

TL-3: Expand Transit Network

Continue to expand and improve the transit network and its accessibility.

Implementation Actions:

TL-3.1 Support the expansion and improvement of transit systems and ride sharing programs, and encourage their use by the community. (Community)

TL-3.2 Work with Kings County Area Public Transit Agency (KCAPTA) and KCAG to identify federal and local funding to implement identified improvement and expansion projects identified in the Transit Development Plan. (Community)

TL-3.3 Coordinate with KCAPTA and KCAG to determine if transit-supporting infrastructure or similar items that encourage transit use are appropriate for new development near transit stops. (Community)

TL-3.4 Support and encourage new development that provides safe routes to adjacent transit stops, where applicable. (Community)

Performance Criteria	GHG Reduction		Local Agency		Community	
	Regional	SP	Cost	Savings	Cost	Savings
5% increase in ridership due to increased access and small service efficiency improvements	44	0.0002	Low	None	None	Varies

TL-4: Employer-Based Transportation Demand Management (TDM)

Support TDM programs that give commuters and employers resources and incentives to reduce their single-occupancy vehicle trips.

Implementation Actions:

TL-4.1 Coordinate with CalVans to provide targeted marketing and promotion of commute trip reduction programs, including vanpooling programs that connect commuters with low-cost transportation along routes travelled by other community members. (Community)

TL-4.2 Work with employers and developers to provide affordable transportation alternatives and telecommuting options to serve both new and existing land uses. (Community)

TL-4.3 Support compliance with SJVAPCD Rule 9410 by providing guidance and resources to employers required to comply with the eTRIP Rule. The eTRIP Rule requires employers with over 100 eligible employees to establish an Employer Trip Reduction Implementation Plan (eTRIP) to encourage employees to reduce single-occupancy vehicle trips by providing end of trip facilities such as preferential parking for vanpools and rideshare, bicycle parking, and other facilities suitable for the type of business. (Community)

TL-4.4 Provide information on, and links to, vanpool programs and employer services offered through CalVans on the jurisdiction's website, as feasible. (Community)

Performance Criteria	GHG Reduction		Local Agency		Community	
	Regional	SP	Cost	Savings	Cost	Savings
2.83% reduction in vehicle trips resulting in a 3.17% reduction in employee commute VMT to large (100+) worksites. Assumes 45.6% of home-based work trips are driven by employees working at large worksites	10,121	0.0458	Low to Medium	None	None	Varies

TL-5: Parking Supply Management

Reduce parking requirements in areas such as large worksites (100+ employees) or downtowns where a variety of uses and services are planned in close proximity to one another and to transit.

Implementation Actions:

TL.5.1 Conduct an assessment of existing parking requirements and identify opportunities to reduce them as a means of facilitating alternative transportation. (Community)

TL.5.2 Allow the joint use of parking facilities for both private businesses and public agencies. (Community)

Performance Criteria	GHG Reduction		Local Agency		Community	
	Regional	SP	Cost	Savings	Cost	Savings
12% reduction in parking at major worksites (over 100 employees)	8,301	0.0375	Low	None	None	Varies

TL-6: Electric Vehicle Readiness

Expand the use of electric vehicles through implementation of a comprehensive electric vehicle network.

Implementation Actions:

TL-6.1 Coordinate with Clean Cities Coalition to develop an Alternative-Fuel Readiness Plan to support strategic planning for alternative fuel vehicles and infrastructure. (Community)

TL-6.2 Work with the local electric utility to develop and implement an electric vehicle charging infrastructure plan, including permitting standards for charging stations, for the community. (Community)

TL-6.3 Provide a link to the PlugShare website on the local jurisdiction's website, as feasible, to help community members locate electric vehicle charging stations in the region. (Community)

Performance Criteria	GHG Reduction		Local Agency		Community	
	Regional	SP	Cost	Savings	Cost	Savings
5% electric vehicle penetration by 2020 based on implementation of comprehensive electric vehicle network	12,494	0.0565	Medium	None	None	Varies

TL-7: Low Carbon/Alternative Fuel Vehicles

Increase the use of low carbon/alternative fuel vehicles through the expansion of fueling infrastructure.

Implementation Actions:

TL-7.1 Partner with the San Joaquin Valley Clean Cities Coalition to encourage the development of compressed natural gas (CNG) or other alternative fueling stations within the region (e.g., by providing technical assistance, public recognition, information about funding opportunities, application assistance, etc.) to support the conversion of heavy-duty gasoline and diesel vehicles to alternative fuels. (Community)

TL-7.2 Coordinate with the local natural gas utility to inform community members of the benefits and cost savings associated with natural gas powered vehicles. Provide information on the jurisdiction's website, as feasible, including a list of local CNG retailers and CNG conversion auto shops, as well as links to the CNG California website and local gas utility's webpage comparing natural gas to other transportation fuels. (Community)

TL-7.3 Develop a low-emissions vehicle replacement /purchasing policy for official municipal vehicles and equipment. This would not apply to vehicles with special performance requirements. (Local Agency)

Performance Criteria	GHG Reduction		Local Agency		Community	
	Regional	SP	Cost	Savings	Cost	Savings
7.5% of medium-heavy and heavy-heavy duty vehicles belonging to private fleets will convert to CNG by 2020. Assumes 75% of medium-heavy-heavy and heavy-heavy duty vehicles belong to private fleets. 0.5% of light-duty passenger vehicles will convert to CNG by 2020	24,156	0.1093	Low to Medium	Low	None	Varies

TL-8: Traffic Flow and Light-Duty Passenger Vehicle Idling

Implement improvements to smooth traffic flow, reduce idling, and eliminate bottlenecks.

Implementation Actions:

TL-8.1 Continue to improve traffic flow and reduce vehicle idling through actions such as synchronized signals and other traffic flow management techniques. (Community)

TL-8.2 Work with KCAG to implement traffic flow improvements currently programmed in the Federal Transportation Improvement Program (FTIP). (Community)

Performance Criteria	GHG Reduction		Local Agency		Community	
	Regional	SP	Cost	Savings	Cost	Savings
Implementation of traffic flow improvements currently programmed in the KCAG FTIP	4,818	0.0218	None	None	None	Varies

3.4 Solid Waste Measures

As solid waste decomposes in landfills, it releases CH_4, a GHG 21 times more potent than CO_2. In 2005, the waste management sector generated approximately 19,562 MT CO2e.

Waste management can be achieved by reducing the amount of trash and other waste that is discarded; reusing containers, products, and building materials; and recycling as many materials as possible, including green waste and construction materials. The solid waste measure listed in **Table 3-4** focuses on waste management and has the potential to reduce the region's GHG emissions by 663 MT CO_2e (or 0.003 MT CO_2e/SP) by 2020. In addition to reducing GHG emissions, the solid waste measure in this section has the potential to provide other important benefits to the community. These include:

- Cost savings
- Improved air quality
- Resource conservation

Table 3-4: Solid Waste GHG Reduction Measure

Measure Number	Measure	2020 GHG Reductions (MT CO_2e)	
		Regional	SP
S-1	Solid Waste Reduction and Recycling	663	0.0030
Solid Waste Total		**663**	**0.0030**

S-1: Solid Waste Reduction and Recycling

Increase recycling, composting, source reduction, and education efforts to reduce the amount of solid waste sent to landfills.

Implementation Actions:

S-1.1 Encourage the expansion of organic waste collection. (Community)

S-1.2 Work with the local waste hauler to encourage communitywide organics composting and provide outreach to educate the community about home composting. (Community)

S-1.3 Work with the local waste hauler to promote the local California Department of Resources Recycling and Recovery (CalRecycle) Recycling Market Development Zone, which provides low-interest loans, technical assistance, and free product marketing to businesses that use materials from the waste stream to manufacture their products. (Community)

S-1.4 Continue to provide recycling receptacles at events held on municipally-owned or -operated property. (Community)

S-1.5 Continue to provide recycling receptacles at all new municipal-owned and -operated facilities. (Local Agency)

Performance Criteria	GHG Reduction		Local Agency		Community	
	Regional	SP	Cost	Savings	Cost	Savings
Increase solid waste diversion to 60% by 2020	663	0.0030	Low	None	None	None

3.5 Trees and Other Vegetation

Trees and other vegetation absorb and capture CO_2 from the atmosphere in a process called carbon sequestration. By maintaining a healthy urban forest, prolonging the life of trees, and continually increasing the number of trees, the region can increase its net carbon storage over the long term. Trees and other vegetation also reduce local air and surface temperatures by shading buildings, streets, and sidewalks.

The measure listed in **Table 3-5** has the potential to reduce the region's GHG emissions by 16 MT CO_2e (or 16 MT CO_2e/SP) by 2020. In addition to reducing GHG emissions, the trees and other vegetation measure in this section has the potential to provide other important benefits to the community. These include:

- City beautification
- Increased property values
- Improved air quality
- Improved water quality
- Improved public health
- Reduced surface and air temperatures
- Reduced energy usage and associated costs
- Reduced noise pollution

Table 3-5: Trees and Other Vegetation GHG Reduction Measure

Measure Number	Measure	2020 GHG Reductions (MT CO_2e)	
		Region	SP
T-1	Trees, Parks, and Open Space	16	0.0001
Trees and Other Vegetation Total		**16**	**0.0001**

T-1: Trees, Parks, and Open Space

Increase the amount of trees and vegetated parkland and open space to permanently increase carbon storage.

Implementation Actions:

T-1.1 Provide tree planting guidelines that address the types of trees appropriate to plant in the region, with emphasis placed on native, drought-tolerant trees. (Community)

T-1.2 Identify and secure grant funding to plant additional drought-tolerant trees on municipal properties. (Community)

T-1.3 Identify and secure undeveloped land that could be vegetated and converted to parkland or open space. (Community)

Performance Criteria	GHG Reduction		Local Agency		Community	
	Regional	SP	Cost	Savings	Cost	Savings
Plant 1 tree for every 500 residents and employees (approximately 442 total trees by 2020).	16	0.0001	Low	None	None	Varies

3.6 Community Education and Outreach

Community involvement, public education, and outreach are critical to promote individual actions that help reduce GHG emissions and maximize their effect. Local agencies can encourage community members to take the steps necessary to reduce their contribution of GHG emissions by providing information about costs savings and financing programs, and by connecting residents and businesses with information, tools, and resources to help them take action. Effective public participation resulting from the measure listed in **Table 3-6** below will increase the likelihood that the GHG reduction measures identified in this plan achieve their GHG reduction potential. In addition to reducing GHG emissions, the community education and outreach measure described in this section has the potential to provide other important benefits to the community. These include:

- Municipal leadership
- Increased community interaction
- Supports all other GHG reduction measures

Table 3-6: Community Education and Outreach Measure

Measure Number	Measure	2020 GHG Reductions ($MT CO_2e$)	
		Regional	SP
C-1	Community Education and Outreach	Supportive	
Community Education and Outreach Total		**Supportive**	

C-1: Community Education and Outreach

Develop a public outreach program to increase public awareness of the jurisdiction's GHG reduction efforts and actions community members can take to reduce their GHG emissions and achieve cost savings.

Implementation Actions:

C-1.1 Create a climate action planning page on the jurisdiction's website and update every six months, as feasible. (Community)

C-1.2 Work with existing local and regional organizations to raise awareness of ways to reduce GHG emissions, with an emphasis on cost savings and benefits. (Community)

C-1.3 Recognize individuals, groups, or businesses that have made changes to reduce their GHG emissions on the jurisdiction's climate action planning page, in the jurisdiction's newsletter, or other mechanisms, as feasible. (Community)

Performance Criteria	GHG Reduction		Local Agency		Community	
	Regional	SP	Cost	Savings	Cost	Savings
Establish a public outreach program	Supportive		Medium to High	None	None	None

3.7 GHG Reduction Summary

As discussed in Chapter 2, *GHG Emissions and Reduction Target*, the region will need to reduce its emissions by 110,559 MT CO_2e (or 0.5 MT CO_2e/SP) by 2020 to meet its 15 percent reduction target. The GHG reduction measures in this CAP are estimated to reduce the region's GHG emissions by 114,408 MT CO_2e (or 0.52 MT CO_2e/SP) by 2020, as summarized in **Table 3-7**. Therefore, implementation of the measures identified in this chapter would enable the region to meets its 15 percent reduction target by 2020.

Table 3-7: Summary of GHG Reductions by Measure

GHG Reduction Measure	2020 GHG Reductions (MT CO_2e)	
	Regional	SP
ENERGY MEASURES		
E-1: Energy Efficiency and Conservation	6,054	0.0274
E-2: Energy Audit and Retrofit Program	12,524	0.0567
E-3: Income-Qualified Energy Efficient Weatherization	6,730	0.0305
E-4: On-Site Small Scale Solar Energy	10,617	0.0480
E-5: Incentives for Exceeding Title 24 Building Standards	11,716	0.0530
TRANSPORTATION AND LAND USE MEASURES		
TL-1: Infill and Mixed-Use Development	6,139	0.0278
TL-2: Bicycle and Pedestrian Environment	15	0.0001
TL-3: Expand Transit Network	44	0.0002
TL-4: Employer-Based TDM	10,121	0.0458
TL-5: Parking Supply Management	8,301	0.0375
TL-6: Electric Vehicle Readiness	12,494	0.0565
TL-7: Low Carbon/Alternative Fuel Vehicles	24,156	0.1093
TL-8: Traffic Flow and Light-Duty Passenger Vehicle Idling	4,818	0.0218
SOLID WASTE MEASURES		
S-1: Solid Waste Reduction and Recycling	663	0.0030
TREES AND OTHER VEGETATION MEASURES		
T-1: Trees, Parks, and Open Space	16	0.0001
COMMUNITY EDUCATION AND OUTREACH MEASURES		
C-1: Community Education and Outreach	Supportive	
TOTAL	114,408	0.5177

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CHAPTER 4

IMPLEMENTATION AND MONITORING

4.0 Implementation and Monitoring

Implementation and monitoring are essential components of the CAP to ensure that the region reduces its GHG emissions and meets its target. This chapter identifies key steps that the jurisdictions in the region will take to implement the CAP and monitor the progress in reducing GHG emissions consistent with AB 32. It also describes potential funding sources and mechanisms available to implement the CAP.

As discussed in Chapter 3, *GHG Reduction Measures*, it is at the discretion of each jurisdiction to decide whether and how to best implement the various policy measures listed in this plan.[1] For example, a policy measure at the local level could be implemented through a local government regulation, incentive, program, public-private collaboration, or by a variety of entities such as a local government, private developer, business, non-profit, or a combination thereof. For many actions to be successful, implementation will require partnerships between representatives of regional and local governments, utilities, agencies, organizations, residents of, and businesses in, the Kings County region.

[1] If a participating jurisdiction wishes to use the CAP for tiering and streamlining the analysis of GHG emissions for future projects under CEQA, the jurisdiction must demonstrate effective implementation of applicable GHG reduction measures to achieve the jurisdiction's 4.03 MT CO_2e/SP target, consistent with AB 32, as well as adherence to all requirements pursuant to Section 15183.5 of the CEQA Guidelines.

4.1 Implementation Matrix

Ensuring that the CAP measures translate into measurable reductions in GHG emissions is critical to the success of the CAP. To facilitate this, each measure and its corresponding implementation actions identified in Chapter 3, *Climate Action Measures*, is listed in the implementation matrix in **Table 4-1** along with the following items:

- **Responsible Jurisdiction(s):** the local jurisdiction(s) that will be responsible for implementing, monitoring, and reporting on the progress of the selected measure and corresponding actions.
- **Implementation Time Frame:** the phase in which this measure should begin implementation. Timeframes include:
    - Near-Term – By 2016
    - Mid-Term – 2017-2018
    - Long-Term – 2019-2020
- **Local Agency Cost and Savings Estimates:** for each measure, potential costs and savings to the participating jurisdiction(s) are categorized as none ($0), low ($1-$25,000), medium ($25,001-$50,000), and high ($50,001 or greater). Supporting information on costs and savings is provided in **Appendix C**.
- **GHG Reduction Potential:** the GHG reduction potential value identifies the estimated annual emission reductions anticipated by 2020, measured in MT CO_2e per year. Reductions are presented as a regional total as well as by service population (SP). Supporting information pertaining to the reduction calculations is provided in **Appendix B**.
- **Performance Criteria:** the outcome necessary to achieve the measure's GHG emissions reduction potential by 2020. Performance criteria enable the jurisdictions to track measure implementation and generally monitor progress. As discussed in Chapter 3, performance criteria were developed based on a review of existing local jurisdictions actions since 2005, as well as assumptions made about the degree of implementation in the year 2020. Performance criteria were reviewed by local jurisdiction staff and the Advisory Committee to ensure that assumptions were appropriate for the region and achievable within the implementation time frame.

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Table 4.1: Implementation Matrix

Measure	Actions	Responsible Jurisdiction(s)	Potential Cost	Potential Savings	2020 GHG Reduction (MT CO_2e)	Performance Criteria	Implementation Time Frame
Energy Measures							
E-1: Energy Efficiency Outreach and Conservation	**E-1.1:** Work with local electricity and natural gas utility provider(s) to promote use of utility financial incentives to improve energy efficiency, such as by using on-bill financing, rebates and tax credits, and demand management programs. (Community) **E-1.2:** Participate/continue to participate in the San Joaquin Valley Clean Energy Organization's (SJVCEO) Valley Innovative Energy Watch (VIEW) Partnership and/or PG&E's Energy Watch partnership program to increase community awareness and support of the California Long Term Energy Efficiency Strategic Plan through education, marketing and outreach. (Community) **E-1.3:** Conduct additional outreach and promotional activities, either individually or in collaboration with local electricity and natural gas utility provider(s) and/or local businesses and organizations (e.g., SJVCEO), targeting specific groups within the community (e.g., homeowners, renters, businesses, income-qualified households, etc.). (Community) **E-1.4:** Collaborate with local agencies and work with local electricity and natural gas utility provider(s) to hold an educational workshop regarding measures that individuals can take to reduce energy usage. (Community)	Avenal, Hanford	Medium	None	6,054 (0.0274/SP)	30% of households and 35% of non-residential building owners participate in an incentive program with an average energy savings of 5% per household and 7% per non-residential building	Near-Term

Table 4.1: Implementation Matrix

Measure	Actions	Responsible Jurisdiction(s)	Potential Cost	Potential Savings	2020 GHG Reduction (MT CO_2e)	Performance Criteria	Implementation Time Frame
	E-1.5: Work with the Kings County Office of Education, local school districts, SJVCEO, and the SJVAPCD to provide information to students regarding energy efficiency and conservation, and the environmental impact of energy use on the community as a whole. (Community) **E-1.6:** Track energy efficiency and conservation related rebate and incentive programs and provide this information to public and private sector partners through the local jurisdiction's website, e-mail distribution lists, newsletters, social media, and other outreach opportunities, as feasible. (Community)						
E-2: Energy Audit and Retrofit Program	**E-2.1:** Collaborate with local electricity and natural gas utility provider(s) and local businesses and organizations (e.g., SJVCEO) to promote voluntary residential and non-residential energy assessment programs and upgrade packages that leverage existing rebates, such as Direct Install Programs. (Community) **E-2.2:** Work with local electricity and natural gas utility provider(s) and local businesses and organizations (e.g., SJVCEO) to conduct additional outreach and promotional activities targeting specific groups (e.g., owners of buildings built prior to Title 24, income-	Avenal, Hanford	Low to Medium	Varies	12,524 (0.0567/SP)	25% of households and non-residential buildings audited. Assumes 40% of buildings audited will result in energy efficiency improvements that on average result in 20% energy savings.	Mid-Term

Table 4.1: Implementation Matrix

Measure	Actions	Responsible Jurisdiction(s)	Potential Cost	Potential Savings	2020 GHG Reduction (MT CO_2e)	Performance Criteria	Implementation Time Frame
	qualified households, etc.). (Community) **E-2.3:** Participate in and promote a residential and commercial energy efficiency financing program (e.g., through a Property Assessed Clean Energy [PACE] program, CaliforniaFIRST, a joint powers authority with other local agencies, or other mechanisms) allowing residential and commercial property owners to voluntarily invest in energy efficiency upgrades for their buildings. (Community) **E-2.4:** Work with local electricity and natural gas utility provider(s) to access technical assistance and financial incentives, such as facility audits, rebates, on-bill financing, loans, grants, and savings-by-design programs. (Local Agency) **E-2.5:** Continue to identify and replace inefficient local agency-owned or -operated public lighting in parking lots, streets, and other public areas. (Local Agency)						
E-3: Income-Qualified Energy Efficient Weatherization	**E-3.1:** Promote/continue to promote income-qualified weatherization programs (e.g., Energy Upgrade California), either individually, or in collaboration with an existing organization, to income-qualified households using sources of data available to the local agency, (e.g., water bills, housing records, etc.). (Community)	Avenal, Hanford	Low to Medium	None	6,730 (0.0305/SP)	10% of low- and middle-income residential units upgraded with an average energy savings of 35%	Near-Term

Table 4.1: Implementation Matrix

Measure	Actions	Responsible Jurisdiction(s)	Potential Cost	Potential Savings	2020 GHG Reduction (MT CO_2e)	Performance Criteria	Implementation Time Frame
	E-3.2: Work with local electricity and natural gas utility provider(s), SJVCEO VIEW Partnership, Kings Community Action Organization, and/or Self-Help Enterprises to provide weatherization assistance through income-qualified weatherization programs, such as Direct Install Programs. (Community)						
E-4: On-Site Small-Scale Solar Energy	**E-4.1:** Encourage local homebuilders to participate in the New Solar Homes Partnership to install solar PV systems on qualifying new homes. (Community) **E-4.2:** Work with the building industry to incorporate designs improving solar readiness into building plans through voluntary green building guidelines. (Community) **E-4.3:** Provide a link to solar PV rebate and incentive programs, including the Single Family Affordable Solar Homes (SASH) Program and the Multifamily Affordable Solar Homes (MASH) Program, on the local jurisdiction's website, as feasible. (Community) **E-4.4:** Improve the permit review and approval process for small (under 10 kW) solar PV systems by implementing recommendations for streamlined permitting identified in the California Solar Permitting Guidebook (e.g., use standardized forms, provide clear written instructions on the permitting process and a	Avenal, Hanford	Medium to High	Low	10,617 (0.048/SP)	10% of households install solar PV systems (average of 6 kW per system) and 5% of households install solar water heaters by 2020. 1 non-residential solar PV installation (average of 6 kW per system) per 50 employees and 1 solar water heater installation per 100 employees	Near-Term

Table 4.1: Implementation Matrix

Measure	Actions	Responsible Jurisdiction(s)	Potential Cost	Potential Savings	2020 GHG Reduction (MT CO_2e)	Performance Criteria	Implementation Time Frame
	checklist of required application materials, make information available on the local agency's website and at the permit counter, etc.). (Community) **E-4.5:** Participate in and promote a residential and commercial renewable energy financing program (e.g., through a PACE program, CaliforniaFIRST, a joint powers authority with other local agencies, or other mechanisms) allowing residential and commercial property owners to voluntarily invest in renewable energy systems for their buildings. (Community) **E-4.6:** Identify and secure funding (e.g., through grants, on-bill financing, loans, energy performance contracts, lease-purchase agreements, or other mechanisms) to install solar PV systems at municipal properties and facilities, where feasible. (Local Agency)						
E-5: Incentives for Exceeding Title 24 Building Standards	**E-5.1:** Provide support to and recognition of developers proposing projects that voluntarily exceed Title 24 Energy Efficiency Building Standards, meet the state's Green Building Standards voluntary tier levels, or are LEED, Greenpoint, or ENERGY STAR rated. (Community) **E-5.2:** Provide project applicants with green building resources, including the SJVAPCD's Best Performance Standards list for GHG	Avenal, Hanford	Low to Medium	None	11,716 (0.0530/SP)	20% of new or remodeled residences and non-residential buildings exceed 2013 Title 24 energy efficiency standards by 20%	Mid-Term

Table 4.1: Implementation Matrix

Measure	Actions	Responsible Jurisdiction(s)	Potential Cost	Potential Savings	2020 GHG Reduction (MT CO_2e)	Performance Criteria	Implementation Time Frame
	reductions, and promote workshops offered by community organizations. (Community) **E-5.3:** Encourage through education and/or incentives energy efficient development design such as, provisions for solar access, building siting to maximize natural heating and cooling, and landscaping to aid passive cooling. (Community)						
Transportation and Land Use Measures							
TL-1: Infill and Mixed-Use Development	**TL-1.1:** Support and encourage mixed-use and medium- and high-density land use categories located within ¼ mile of a transit stop, park and ride facility, or existing developed areas, by allowing flexible zoning and/or density bonuses for applicable projects. (Community) **TL-1.2:** Prioritize infill development by publicly providing the location and zoning of infill sites on the local jurisdiction's website and working with developers to expedite applications. (Community) **TL-1.3:** Allow live/work developments that permit residents to live at their place of work and thereby reduce VMT and associated GHG emissions. (Community) **TL-1.4:** Through the development review process, evaluate development projects based on consistency with applicable general plan policies, zoning regulations, and design guidelines including the Kings County Smart	Avenal, Hanford	Low to Medium	None	6,139 (0.0278/SP)	20% shift of net new growth to within a quarter mile of transit stops or existing developed areas	Near-Term

Table 4.1: Implementation Matrix

Measure	Actions	Responsible Jurisdiction(s)	Potential Cost	Potential Savings	2020 GHG Reduction (MT CO_2e)	Performance Criteria	Implementation Time Frame
	Growth Principles and Kings County and San Joaquin Valley Blueprint. (Community) **TL-1.5:** Work with KCAG in the updates to the Kings County Blueprint to direct future growth to existing urbanized areas through implementation of smart growth principles and use of toolkit resources identified in the Blueprint. (Community) **TL-1.6:** Showcase infill and mixed-use projects on the local jurisdiction's website and in newsletters, etc., as feasible. (Community)						
TL-2: Bicycle and Pedestrian Environment	**TL-2.1:** Continue to pursue public and private funding to expand and link the regional bicycle and pedestrian network in accordance with the local jurisdiction's general plan and bicycle plan, and the Regional Bicycle Plan/Regional Active Transportation Plan. (Community) **TL-2.2:** Incorporate multi-modal improvements into pavement resurfacing, restriping, and signalization operations where safety and convenience of users can be improved within the scope of work. (Community) **TL-2.3:** Establish minimum design criteria for bicycle and pedestrian circulation and implement through the design review process. (Community) **TL-2.4:** Encourage the installation of adequate and secure bicycle parking at all multi-family	Avenal, Hanford	Low	None	15 (0.0001/SP)	0.2% increase in walking/bicycling trips in incorporated areas and 0.1% increase in walking/bicycling trips in unincorporated area	Mid-Term

Table 4.1: Implementation Matrix

Measure	Actions	Responsible Jurisdiction(s)	Potential Cost	Potential Savings	2020 GHG Reduction (MT CO_2e)	Performance Criteria	Implementation Time Frame
	residential, commercial, governmental, and recreational locations throughout the region. (Community) **TL-2.5:** Support land use planning that will promote pedestrian and bicyclist access to and from new development by encouraging land use and subdivision designs that provide safe bicycle and pedestrian circulation, including bicycle parking facilities and internal bicycle and pedestrian routes, where feasible. (Community) **TL-2.6:** Collaborate/continue to collaborate with law enforcement, school officials, and private organizations to encourage school and/or public bicycle safety programs. (Community)						
TL-3: Expand Transit Network	**TL-3.1:** Support the expansion and improvement of transit systems and ride sharing programs and encourage their use by the community. (Community) **TL-3.2:** Work with Kings County Area Public Transit Agency (KCAPTA) and KCAG to identify federal and local funding to implement identified improvement and expansion projects identified in the Transit Development Plan. (Community) **TL-3.3:** Coordinate with KAPTA and KCAG to determine if transit-supporting infrastructure or similar items that encourage transit use are	Avenal, Hanford	Low	None	44 (0.0002/SP)	5% increase in ridership due to increased access and small service efficiency improvements	Near-Term

Table 4.1: Implementation Matrix

Measure	Actions	Responsible Jurisdiction(s)	Potential Cost	Potential Savings	2020 GHG Reduction (MT CO_2e)	Performance Criteria	Implementation Time Frame
	appropriate for new development near transit stops. (Community) **TL-3.4:** Support and encourage new development that provides safe routes to adjacent transit stops, where applicable. (Community)						
TL-4: Employer-Based Transportation Demand Management (TDM)	**TL-4.1:** Coordinate with CalVans to provide targeted marketing and promotion of commute trip reduction programs, including vanpooling programs that connect commuters with low-cost transportation along routes travelled by other community members. (Community) **TL-4.2:** Work with employers and developers to provide affordable transportation alternatives and telecommuting options to serve both new and existing land uses. (Community) **TL-4.3:** Support compliance with SJVAPCD Rule 9410 by providing guidance and resources to employers required to comply with the eTRIP Rule. The eTRIP Rule requires employers with over 100 eligible employees to establish an Employer Trip Reduction Implementation Plan (eTRIP) to encourage employees to reduce single-occupancy vehicle trips by providing end of trip facilities such as preferential parking for vanpools and rideshare, bicycle parking, and other facilities	Avenal, Hanford	Low to Medium	None	10,121 (0.0458/SP)	2.83% reduction in vehicle trips resulting in a 3.17% reduction in employee commute VMT to large (100+) worksites. Assumes 45.6% of home-based work trips are driven by employees working at large worksites	Mid-Term

Table 4.1: Implementation Matrix

Measure	Actions	Responsible Jurisdiction(s)	Potential Cost	Potential Savings	2020 GHG Reduction (MT CO_2e)	Performance Criteria	Implementation Time Frame
	suitable for the type of business. (Community) **TL-4.4:** Provide information on, and links to, vanpool programs and employer services offered through CalVans on the jurisdiction's website, as feasible. (Community)						
TL-5: Parking Supply Management	**TL.5.1:** Conduct an assessment of existing parking requirements and identify opportunities to reduce them as a means of facilitating alternative transportation. (Community) **TL.5.2:** Allow the joint use of parking facilities for both private businesses and public agencies. (Community)	Avenal, Hanford	Low	None	8,301 (0.0375/SP)	12% reduction in parking at major worksites (over 100 employees)	Mid-Term
TL-6: Electric Vehicle Readiness	**TL-6.1**: Coordinate with Clean Cities Coalition to develop an Alternative-Fuel Readiness Plan to support strategic planning for alternative fuel vehicles and infrastructure. (Community) **TL-6.2:** Work with the local electric utility to develop and implement an electric vehicle charging infrastructure plan, including permitting standards for charging stations, for the community. (Community) **TL-6.3:** Provide a link to the PlugShare website on the local jurisdiction's website, as feasible, to help community members locate electric vehicle charging stations in the region. (Community)	Avenal, Hanford	Medium	None	12,494 (0.0565/SP)	5% electric vehicle penetration by 2020 based on implementation of comprehensive electric vehicle network	Long-Term

Table 4.1: Implementation Matrix

Measure	Actions	Responsible Jurisdiction(s)	Potential Cost	Potential Savings	2020 GHG Reduction (MT CO_2e)	Performance Criteria	Implementation Time Frame
TL-7: Low Carbon/Alternative Fuel Vehicles	**TL-7.1:** Partner with the San Joaquin Valley Clean Cities Coalition to encourage the development of compressed natural gas (CNG) or other alternative fueling stations within the region (e.g., by providing technical assistance, public recognition, information about funding opportunities, application assistance, etc.) to support the conversion of heavy-duty gasoline and diesel vehicles to alternative fuels. (Community) **TL-7.2:** Coordinate with the local natural gas utility to inform community members of the benefits and cost savings associated with natural gas powered vehicles. Provide information on the jurisdiction's website, as feasible, including a list of local CNG retailers and CNG conversion auto shops as well as links to the CNG California website and local gas utility's webpage comparing natural gas to other transportation fuels. (Community) **TL-7.3:** Develop a low-emissions vehicle replacement /purchasing policy for official municipal vehicles and equipment. This would not apply to vehicles with special performance requirements. (Local Agency)	Avenal, Hanford	Low to Medium	Low	24,156 (0.1093/SP)	7.5% of medium-heavy and heavy-heavy duty vehicles belonging to private fleets will convert to CNG by 2020. Assumes 75% of medium-heavy-heavy and heavy-heavy duty vehicles belong to private fleets. 0.5% of light-duty passenger vehicles will convert to CNG by 2020	Long-Term

Table 4.1: Implementation Matrix

Measure	Actions	Responsible Jurisdiction(s)	Potential Cost	Potential Savings	2020 GHG Reduction (MT CO_2e)	Performance Criteria	Implementation Time Frame
TL-8: Traffic Flow and Light-Duty Passenger Vehicle Idling	**TL-8.1:** Continue to improve traffic flow and reduce vehicle idling through actions such as synchronized signals and other traffic flow management techniques. (Community) **TL-8.2:** Work with KCAG to implement traffic flow improvements currently programmed in the FTIP. (Community)	Avenal, Hanford	None	None	4,818 (0.0218/SP)	Implementation of traffic flow improvements currently programmed in the KCAG FTIP	Long-Term
Solid Waste Measure							
S-1: Solid Waste Reduction and Recycling	**S-1.1:** Encourage the expansion of organic waste collection. (Community) **S-1.2:** Work with the local waste hauler to encourage communitywide organics composting and provide outreach to educate the community about home composting. (Community) **S-1.3:** Work with the local waste hauler to promote the local CalRecycle Recycling Market Development Zone which provides low-interest loans, technical assistance, and free product marketing to businesses that use materials from the waste stream to manufacture their products. (Community) **S-1.4:** Continue to provide recycling receptacles at events held on municipally-owned or -operated property. (Community) **S-1.5:** Continue to provide recycling receptacles at all new municipal-owned and -operated facilities. (Local Agency)	Avenal, Hanford	Low	None	663 (0.003/SP)	Increase solid waste diversion to 60% by 2020	Long-Term

Table 4.1: Implementation Matrix

Measure	Actions	Responsible Jurisdiction(s)	Potential Cost	Potential Savings	2020 GHG Reduction (MT CO_2e)	Performance Criteria	Implementation Time Frame
Trees and Other Vegetation							
T-1: Trees, Parks, and Open Space	**T-1.1:** Provide tree planting guidelines that address the types of trees appropriate to plant in the region, with emphasis placed on native, drought-tolerant trees. (Community) **T-1.2:** Identify and secure grant funding to plant additional drought-tolerant trees on municipal properties. (Community) **T-1.3:** Identify and secure undeveloped land that could be vegetated and converted to parkland or open space. (Community)	Avenal, Hanford	Low	None	16 (0.0001/SP)	Plant 1 tree for every 500 residents and employees (approximately 442 total trees by 2020).	Long-Term
Community Education and Outreach							
C-1: Community Education and Outreach	**C-1.1:** Create a climate action planning page on the jurisdiction's website and update every six months, as feasible. (Community) **C-1.2:** Work with existing local and regional organizations to raise awareness of ways to reduce GHG emissions, with an emphasis on cost savings and benefits. (Community) **C-1.3:** Recognize individuals, groups, or businesses that have made changes to reduce their GHG emissions on the jurisdiction's climate action planning page, in the jurisdiction's newsletter, or other mechanisms, as feasible. (Community)	Avenal, Hanford	Medium to High	None	Supportive	Establish a public outreach program	Near-Term

4.2 Implementation and Monitoring Policies

CAP implementation and monitoring will require local jurisdiction leadership to execute CAP measures and actions, report on the progress of implementation and performance, and if necessary, alter or amend the CAP in the future to ensure that the plan remains effective and on track toward meeting its target. The following policies and actions were developed to guide CAP implementation and monitoring.

I-1: CAP Coordinator

Establish a CAP Coordinator to implement, monitor, and report on the status of measures and actions identified in the CAP.

Implementation Actions:

I-1.1 Designate a City staff member to have lead responsibilities for overseeing CAP implementation and monitoring. Duties of this position include preparing the annual CAP progress report to City Council, and coordinating the GHG emissions inventory and CAP updates, as specified in this chapter.

I-1.2 Provide CAP implementation and GHG reduction training to staff members who will be involved in CAP implementation or monitoring.

I-2: CAP Measure Evaluation

Annually monitor and report on the implementation and performance of the GHG reduction measures and implementation actions.

Implementation Actions:

I-2.1 Prepare an annual progress report for City Council review and consideration. The progress report should:

- Identify the implementation status of each measure (including how new development projects have been implementing CAP measures);
- Evaluate achievement of or progress toward performance criteria;
- Assess the effectiveness of measures included in the CAP;
- Report on the State's implementation of state-level measures included in the CAP; and
- Recommend adjustments to actions or tactics, as needed.

I-2.2 Review performance of GHG reduction measures to determine if all necessary requirements outlined in Section 15183.5 of the CEQA Guidelines are being met in order

to utilize the CAP for tiering and streamlining of GHG emissions for future projects under CEQA.

I-3: GHG Emissions Inventory and CAP Updates

Re-inventory regional GHG emissions approximately every five years, as feasible, to evaluate the performance of the CAP as a whole, and if necessary, alter or amend the CAP to ensure that the plan remains on track.

Implementation Actions:

I-3.1 Conduct a regional GHG inventory update every five years, as feasible, and evaluate CAP performance.

I-3.2 Update the CAP as necessary based on the results of the inventory, and to reflect new programs or policies to reduce GHG emissions.

At this time, the State has not created a mandate for further reductions beyond the 2020 target. The State has identified a long-term goal for State agencies of reducing emissions to 80 percent below 1990 emissions levels by 2050 (in Executive Order S-3-05), but has not adopted the target and does not plan for meeting this goal. As such, this CAP does not identify a target beyond 2020. As the year 2020 approaches, the State is likely to adopt a target for later years and, at that time the region will consider adopting a reduction target for a later year, considering the State's longer-term target.

4.3 Funding Sources

One of the greatest challenges to CAP implementation is funding availability. There are multiple grant and loan programs through federal, state and regional agencies and organizations to reduce GHG emissions. This section identifies potential funding sources that the local jurisdictions could pursue to offset the financial cost of implementing the GHG reduction measures.

The spectrum of public and private funding options for the measures outlined in this CAP is ever evolving. The programs listed below represent the current (2014) status of those options that are most relevant to the CAP. These funding sources could quickly become out-of-date; therefore, it is important to evaluate the status of a given program before seeking funding, as availability and application processes are updated periodically. In addition, there are general sources of funding that provide the most up-to-date information and should be reviewed on a regular basis, including:

- U. S. Department of Energy
- Federal Transit Administration
- California Energy Commission
- California Strategic Growth Council

- California Public Utilities Commission (CPUC)
- California Department of Transportation (Caltrans)
- California Department of Housing and Community Development
- California Infrastructure and Economic Development Bank
- California Department of Parks and Recreation
- California Department of Forestry and Fire Protection (CAL FIRE)
- California Statewide Communities Development Authority
- California Department of Resources Recycling and Recovery (CalRecycle)
- KCAG
- PG&E
- SCE

Local jurisdictions may also provide funding for various measures outlined in this CAP. This can be accomplished through the annual budgeting and Capital Improvement Program process, which provides an opportunity for citizen input and guides decision-makers while helping them set priorities. The participating jurisdictions can also partner with KCAG, community-based organizations, and private companies for joint programs.

4.3.1 ENERGY-RELATED FUNDING SOURCES

Energy Efficiency and Conservation Block Grant Program
U.S. Department of Energy

The Energy Efficiency and Conservation Block Grant program, funded by the American Recovery and Reinvestment Act of 2009, provides local government grants to reduce fossil-fuel emissions, reduce total energy use, and improve energy efficiency and conservation in the transportation and building sectors. Grants originate from U.S. Department of Energy and are released from both the U.S. Department of Energy and California Energy Commission.

Strategic Growth Council Sustainable Communities Planning Grant Program
California Strategic Growth Council

The Strategic Growth Council provides funding for competitive grants to cities, counties, and designated regional agencies to promote sustainable community planning and natural resource conservation. The grant program supports development, adoption, and implementation of various planning elements. The Sustainable Communities Planning Grant Program offers a unique opportunity to improve and sustain the wise use of infrastructure and natural resources through a coordinated and collaborative approach.

California Investor Owned Utilities (IOUs) Programs
PG&E and SCE

California IOUs, such as PG&E and SCE, are required by the CPUC to offer energy efficiency programs to their customers. Each IOU program is unique; generally the programs offer rebates, financing assistance, design assistance, educational seminars, and other forms of assistance. Rebates may be calculated based on the amount of energy savings or, alternatively, may be fixed rate financial assistance for specific energy efficiency technology.

In conjunction with rebates and incentives programs, PG&E and SCE offers On-Bill Financing programs. The programs for public agencies includes: zero-percent financing on qualifying measures for up to ten years; offsets to energy-efficient upgrade costs after rebates and incentives; loans ranging from a minimum of $5,000 up to $250,000 per meter; and loan installments added to monthly bills.

PG&E also offers the Green Communities and Innovator Pilots energy efficiency programs, which are administrated by PG&E, using funds from the Public Goods Charge authorized by the CPUC. Customers of California's three largest investor-owned utility companies pay the Public Goods Charge through their electric utility bills. Customers pay the surcharge per unit of consumption (kilowatt-hours (kWh)). Money raised by the Public Goods Charge is spent on services and programs deemed to be in the public interest, including energy efficiency initiatives such as Green Communities and Innovator Pilots.

Energy Conservation Assistance Account Program Energy Efficiency Financing
California Energy Commission

The California Energy Commission offers low-interest loans (one to three percent) to help local jurisdictions and agriculture projects finance energy-efficient projects as part of the Energy Conservation Assistance Account Program. Projects with proven energy and/or capacity savings are eligible, provided they meet the eligibility requirements. Examples of projects include: lighting systems, pumps and motors, energy efficient streetlights and traffic signals, automated energy management systems/controls, building insulation, renewable energy generation and combined heat and power projects, heating and air conditioning modifications, and wastewater treatment equipment. The maximum loan amount is $3 million per application for 15 years. There is no minimum loan amount.

California Feed-In Tariff
California Energy Commission

The California feed-in tariff allows eligible customer-generators to enter into 10-, 15- or 20-year standard contracts with their utilities to sell the electricity produced by small renewable energy systems -- up to three megawatts -- at time-differentiated market-based prices. The price paid will be based on the Renewable Market Adjusting Tariff (Re-MAT). The CPUC has separated the technologies eligible to participate in the feed-in tariff into three project type categories: baseload (bioenergy and geothermal), peaking as-available (solar), and non-peaking as-available (wind and hydro). The CPUC built in price adjustment mechanisms to allow the program to adapt to changing market conditions. Interested

generators must start by submitting a program participation request with the utility. The utility will establish a queue on a first-come first-served basis for each product type and will extend a Re-MAT price offer to the applicants.

4.3.2 TRANSPORTATION-RELATED FUNDING SOURCES

Many federal, state, and regional grant programs are available to fund transportation and infrastructure improvements. The programs listed below represent the current status of the most relevant of these programs.

Livability Grant Programs (5309)
Federal Transit Administration

The Federal Transit Administration provides resources on sustainable communities and transit oriented development. This includes access to transit oriented development resources and training free of charge to local government employees. The Federal Transit Administration's Livable and Sustainable Communities program supports initiatives that demonstrate ways to improve the link between public transit and communities. The Federal Transit Administration offers a broad selection of Livability Grant Programs that fund projects for accessible, livable, and sustainable communities. In particular, the Transit-Oriented Development Planning Pilot Program and Bus and Bus Facilities Discretionary Program provide capital assistance for new buses and intermodal transit centers. The New Starts and Small Starts Program supports transit "guideway" capital investments, such as rapid rail, light rail, commuter rail, automated guideway transit, people movers, bus rapid transit, and other high occupancy vehicles. Additionally, the Intercity Bus Program supports transit access to residents in non-urbanized areas.

Alternative and Renewable Fuel and Vehicle Technology Program
California Energy Commission

The Alternative and Renewable Fuel and Vehicle Technology Program (also known as AB 118) provides financial incentives (i.e., through grants, loans, loan guarantees, revolving loans, and other appropriate measures) to develop and deploy alternative and renewable fuels and advanced transportation technologies to help attain the state's climate change policy objectives. Projects selected for program funding accelerate the development of alternative transportation fuels through the improvement and commercialization of existing and emerging alternative fuel vehicles and infrastructure. The California Energy Commission has an annual program budget of approximately $100 million.

Community-Based Transportation Planning Grant Program
Caltrans

The Community-Based Transportation Planning Grant Program is primarily used to seed planning activities that encourage livable communities. Grants assist local agencies to better integrate land use and transportation planning, to develop alternatives for addressing growth, and to assess efficient

infrastructure investments that meet community needs. These planning activities are expected to help leverage projects that foster sustainable economies, increase available affordable housing, improve housing/jobs balance, encourage transit oriented and mixed use development, expand transportation choices, reflect community values, and include non-traditional participation in transportation decision making.

Local Assistance Program
Caltrans

Caltrans' Local Assistance Program oversees more than one billion dollars in federal and state funds annually available to over 600 cities, counties, and regional agencies for the purpose of improving their transportation infrastructure or providing transportation services.

Active Transportation Program
Caltrans

The Active Transportation Program (ATP) consolidates existing federal and state transportation programs, including the Transportation Alternatives Program (TAP), Bicycle Transportation Account (BTA), and State Safe Routes to School (SR2S), into a single program with a focus to make California a national leader in active transportation. The ATP is administered by the Division of Local Assistance, Office of Active Transportation and Special Programs and encourages increased use of active modes of transportation by funding projects which achieve the following goals:

- Increase the proportion of the trips accomplished by biking and walking;
- Increase safety and mobility for non-motorized users;
- Advance the active transportation efforts of regional agencies to achieve greenhouse gas reduction goals;
- Enhance public health;
- Ensure that disadvantaged communities fully share in the benefits of the program; and
- Provide a broad spectrum of projects to benefit many types of active transportation users.

Highway Safety Improvement Program
Caltrans

The Highway Safety Improvement Program provides federal funding for work on any public road or publicly owned bicycle/pedestrian pathway or trail that corrects or improves the safety for its users. The program is intended to reduce traffic fatalities and serious injuries on all public roads. Local jurisdictions, such as counties and cities, may apply to Caltrans for funding ranging from $100,000 to $900,000 per project. Federal reimbursements cover up to 90 percent of total project costs. Eligible projects include, but are not limited to, improvements for pedestrian or bicyclist safety, intersection safety improvements, and shoulder widening.

Community Development Block Grant
California Department of Housing and Community Development

The Community Development Block Grant (CDBG) program funds projects and programs that develop viable urban communities by providing decent housing and a suitable living environment and by expanding economic opportunities, principally for persons of low and moderate income. Federal CDBG Grantees may use funds for activities that include, but are not limited to, acquiring real property; building public facilities and improvements, such as streets, sidewalks, and recreational facilities; and planning and administrative expenses, such as costs related to developing a consolidated plan and managing CDBG funds. The State makes funds available to eligible agencies (cities and counties) through a variety of different grant programs.

Infill Infrastructure Grant Program
California Department of Housing and Community Development

The Infill Infrastructure Grant Program assists in the new construction and rehabilitation of infrastructure that supports higher-density affordable housing and mixed-income housing in locations designated as infill. Eligible applicants include, but are not limited to, localities and public housing authorities.

National Recreational Trails Program
California Department of Parks and Recreation

In California, the National Recreational Trails Program is administered by Department of Parks and Recreation to provide funding to develop recreational trails and related facilities for uses such as bicycling and hiking.

Federal Transportation Improvement Program for the Kings County Region
KCAG

The Federal Transportation Improvement Program (FTIP) is a comprehensive listing of federally funded surface transportation projects in Kings County. KCAG prepares and adopts the FTIP every two years in close cooperation with stakeholders such as cities and counties. As part of the FTIP, KCAG plans for the spending of flexible funding from the Congestion Mitigation and Air Quality program, which applies to the following types of projects: enhanced transit services, expanding technology, freeway express bus stops, ridesharing, vanpooling, parallel routes along major transportation corridors, and Park-n-Ride lots. KCAG, in partnership with their member agencies, selects projects that promote the strategies and policies of the RTP.

KCAG will program eligible projects for funding from adjusted apportionments for FY 2014/15 and FY 2015/16 to accommodate carry-over projects and new apportionments for FY 2016/17 and 2017/18. The total estimated apportionment for these years is $7,416,100 ($1,854,025 estimated annual apportionment). A non-federal source of matching funds of at least 11.47% is required for most projects.

Infrastructure State Revolving Fund Program
California Infrastructure and Economic Development Bank

The Infrastructure State Revolving Fund Program provides low-cost financing to public agencies for a wide variety of infrastructure projects. Program funding is available in amounts ranging from $250,000 to $10 million, with loan terms of up to 30 years. Interest rates are set on a monthly basis. Eligible project categories include city streets, county highways, state highways, drainage, water supply and flood control, educational facilities, environmental mitigation measures, parks and recreational facilities, port facilities, public transit, sewage collection and treatment, solid waste collection and disposal, water treatment and distribution, defense conversion, public safety facilities, and power and communications facilities.

4.3.3 SOLID WASTE-RELATED FUNDING SOURCES

Beverage Container Recycling Grant and Payment Programs
CalRecycle

CalRecycle administers funding programs to assist organizations with establishing convenient beverage container recycling and litter abatement projects, and to encourage market development and expansion activities for beverage container materials. The Beverage Container Recycling Grant provides funding to local governments, businesses, individuals, and non-profit organizations for projects that implement new programs or enhance existing programs to provide convenient beverage container recycling opportunities in various locations statewide. Eligible projects include, but are not limited to, the following locations: parks and recreational areas, sporting complexes, community events, office buildings, multifamily dwellings, entertainment/hospitality venues, curbside, restaurants, and schools and colleges. CalRecycle issues up to $1.5 million annually for this program. The City/County Payment Program provides a total of $10.5 million in grant funds annually to eligible cities and counties for beverage container recycling and litter abatement activities. Each city is eligible to receive a minimum of $5,000 or an amount calculated by the Department based on per capita, whichever is greater.

GHG Reduction Grants and Loan Programs
CalRecycle

CalRecycle is providing financial incentives (i.e., grants, loans, etc.) for capital investments in composting/anaerobic digestions infrastructure and recycling manufacturing facilities that will result in reduced GHG emissions. These grants and loans are intended to promote infrastructure development at facilities in California that achieve GHG emission reductions by diverting more materials from landfills and producing beneficial products. Grants and loans will be targeted to build or expand organics infrastructure, such as composting and anaerobic digestion, or reduce food waste in California. Other targeted activities include new or expanded infrastructure for manufacturing products with recycled content fiber, plastic, or glass.

4.3.4 OTHER FUNDING SOURCES

Urban Greening for Sustainable Communities Grant Program

California Strategic Growth Council

Because of the built-out nature of California's urban areas, the Urban Greening for Sustainable Communities Program provides funds to preserve, enhance, increase, or establish community green areas such as urban forests, open spaces, wetlands, and community spaces (e.g., community gardens). The goal is for these greening projects to create more viable and sustainable communities throughout the state. This program has both an Urban Greening Planning Program, which provides funds to assist entities in developing a master urban greening plan, and an Urban Greening Project Program, which provides funds for projects that preserve, enhance, increase or establish community green areas.

Urban and Community Forestry Grant Program

CAL FIRE

The CAL FIRE Urban and Community Forestry Program works to expand and improve the management of trees and related vegetation in communities throughout California. This program offers funding through a variety of grants. The Urban Forest Management Plan Grant funds the development and implementation of a management plan to be used by a jurisdiction to manage its urban forest. Such plans will be holistic and long-term, must include the entire jurisdiction and take an ecosystem management approach, and may include a minimum level of a training or educational component. Local jurisdictions may request between $30,000 and $100,000 and matching contributions totaling 25 percent of the total project cost is required. The Green Trees for the Golden State Grant provides funding for urban tree planting projects and up to two years of initial maintenance.

Partnerships with Other Jurisdictions and Community Organizations

Partnering with neighboring jurisdictions and community organizations is a key implementation strategy supporting the CAP. Various jurisdictions and organizations within the region could serve as potential partners in implementing the CAP strategies. Each participating jurisdiction should seek to partner with appropriate local governments, as identified within CAP measures.

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CHAPTER 5

REFERENCES AND PREPARERS

5.0 References and Preparers

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APPENDIX A

GHG EMISSIONS INVENTORY

Appendix A: GHG Emissions Inventory

This appendix provides the rational for limited scope of GHG emissions that were included in the CAP compared to the comprehensive Community-wide GHG Emissions Inventory (2013) prepared by the SJVAPCD. This appendix also includes the Community-wide GHG Emissions Inventory (2013) report.

As discussed in Chapter 2, the Community-wide GHG Emissions Inventory report includes nine sources of GHG emissions and 69 emissions sub-sources. For the purpose of the CAP, it was necessary to limit the scope of emissions to sources over which the local jurisdictions have some degree of influence or control (ownership, operational control, regulatory authority, enforcement, budgetary, or influence through education and outreach). The U.S. Community Protocol for Accounting and Reporting of GHG Emissions (U.S. Community Protocol) (2012) and Local Government Operations Protocol (2010) provide guidelines for determining the appropriate scope of the inventory depending its intended use. Based on guidance from these protocols, several emissions sources were removed from the CAP's 2005 baseline for the purposes of establishing reduction targets and developing the Regional CAP. **Table A-1** summarizes the sources and emissions sources removed from the inventory and their associated quantity of GHG emissions.

Table A-1: Summary of Sources Removed from Inventory

Source	2005 Emissions (MT CO_2e)
Transportation - Rail	28,025
Transportation - Airports	11,099
Fossil Fuels Industry	24,446
Industrial Processes	53,745
Agriculture – Livestock and Non-Livestock	1,605,827
Agriculture – Carbon Flux	-42,565
Forestry and Land Use	1,550
Other Sources – Nitrogen Deposition	1,240
Total	**1,683,367**

As shown in **Table A-1**, removal of these sources reduced the 2005 baseline total by 1,683,367 MT CO_2e in 2005. **Table A-2** summarizes the adjusted total for the CAP's 2005 baseline inventory, upon which the CAP is based. This adjusted total more accurately represents emissions over which the local jurisdictions have control or the ability to influence through their planning and permitting processes, local ordinances, outreach and education efforts, and municipal operations.

Table A-2: Summary of Adjusted Inventory

	2005 (MT CO_2e)
Inventory – All Sources	2,730,171
Sources Removed	1,683,367
Adjusted Inventory – Local Government Control	**1,046,804**

The following sections provide relevant information and documentation from the U.S. Community Protocol and Local Government Operations Protocol regarding exclusion of the above identified sources:

TRANSPORTATION – RAIL

According to Appendix D of the U.S. Community Protocol, "Rail freight movement and associated emissions are largely beyond the direct control of a local government or a community, as this movement tends to be part of a long-distance supply chain driven by regional and national economic activity. Rail trackage is typically maintained and operated by private corporations or, in some cases, by states. Locomotive emission standards are set at the Federal level.

Passenger rail movement and associated emissions are largely beyond the direct control of a community, as intercity passenger rail trips tend to be longer-distance travel and most will be passing through the community, unless it is a major rail passenger hub. The community through which a passenger rail line passes may or may not generate passenger rail trips, depending upon whether there is a station located in or near the community.

A community may, however, be able to influence rail use by improving infrastructure for access to intermodal terminals or through infrastructure or land use strategies to provide direct rail access to businesses. These strategies will not reduce rail emissions in the community (in fact, they may increase them) but may have the benefit of reducing total GHG emissions from freight transport, if movement of freight can be shifted from less efficient truck to more-efficient rail modes. If a rail switching yard is located within the community, the community may also may be able to work with the yard operator to reduce GHG emissions from locomotives (e.g., by introducing idle reduction technology or operational practices, or by acquiring more efficient genset or hybrid locomotives). Rail yard operations may also be of local interest for air quality reasons."

TRANSPORTATION – AIRPORTS

According to Appendix D of the U.S. Community Protocol, "Local governments have significant policy influence over some transportation emissions sources, for example, passenger vehicles and public transit, but less control over others, for example, air travel and marine vessels.

"Information is not readily available concerning the origin of cargo within the community that travels on aircraft at an individual airport.

Information is not available to precisely ascribe an airport's emissions to a specific community."

INDUSTRIAL PROCESSES AND FOSSIL FUELS INDUSTRY

According to Appendix C of the U.S. Community Protocol, "A community may choose to include these sources in their inventory for the sake of completeness, however, industrial process emissions are likely to be outside of the control of the local government or community at large. Unlike residential and typical commercial energy use, industrial process emissions do not necessarily indicate inefficiencies. Instead, individual industrial process emissions may be a unique byproduct of a specific industry. Therefore, management of these GHG emissions will be most effectively managed from within the industrial organization itself, where growing numbers of industrial organizations recognize industrial process emissions management as a key to maintaining competitiveness."

AGRICULTURE – LIVESTOCK

According to Appendix G of the U.S. Community Protocol, "Uncertainties within the agriculture sector exist to the extent that the inputs used in any calculations are estimates of agricultural activity rather than direct measurements. From the size and characterization of animal populations, to the feeding regimes they are placed under, in most cases these inputs will need to be estimated. Estimation techniques generally rely on scaling down data available at higher levels of aggregation to the local level, and will not capture any specific local variation."

AGRICULTURE – NON-LIVESTOCK, CARBON FLUX

According to Appendix G of the U.S. Community Protocol, "Other agricultural processes that produce greenhouse gas emissions not covered here include N_2O emissions related to soil management practices and CH_4 emissions from the cultivation of rice in submerged fields. The processes that govern the emissions generation from these sources, however, are highly dependent on local soil conditions and can vary widely from community to community and even within a single crop field. Larger scale GHG inventory methods such as those from IPCC and the US National Inventory utilize national averaged emissions factors to estimate emissions from these sources. Using national averaged emissions factors are likely to produce inaccurate results for any particular location. A local inventory that is based on national averaged emissions factors cannot provide policy relevant information that would instruct local officials how they might be able to manage those emissions sources, or to determine whether actions taken have made an impact from one inventory to the next. While emissions from soil management may be significant for some communities, these sources will not be covered in this Protocol until such time as methods to reliably calculate those emissions at the local level are developed."

FORESTRY AND LAND USE

According to Appendix G of the U.S. Community Protocol, "In addition to agricultural practices not covered in this Protocol, a number of other land-use related sources of emissions are also not covered. Emissions from land conversion, forestry and other similar processes again are not covered here for similar reasons as cited above. National and international scale methods do not take into account local variation that can have significant impacts on emissions generation. While these emissions can be estimated, the procedures and depth of study required to do so are beyond the scope of this Protocol. If you have had local studies performed on additional agricultural and land use emissions sources, you may report those as line item direct emissions, citing the models and methods used in making the estimations."

According to Section 4.5 of the Local Government Operations Protocol, "Biogenic emissions related to forestry and land management should not be quantified under this Protocol as the Protocol is designed to account primarily for the anthropogenic sources of GHG emissions, and is not designed to assess the carbon stocks of government-owned lands (see Section 2.3). Biogenic emissions also occur from sources other than combustion, such as the aerobic decomposition of organic matter. These non-combustion biogenic emissions should not be included in your GHG inventory."

OTHER SOURCES – NITROGEN DEPOSITION

According to Section 4.5 of the Local Government Operations Protocol, "Biogenic emissions related to forestry and land management should not be quantified under this Protocol as the Protocol is designed to account primarily for the anthropogenic sources of GHG emissions, and is not designed to assess the carbon stocks of government-owned lands (see Section 2.3). Biogenic emissions also occur from sources other than combustion, such as the aerobic decomposition of organic matter. These non-combustion biogenic emissions should not be included in your GHG inventory."

Community-Wide Greenhouse Gas Emission Inventory for the County of Kings

2005 Baseline Year - 2020 Forecast

Final Draft Report – April 2013

Prepared by

San Joaquin Valley Air Pollution Control District

For

Kings County Association of Governments

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Executive Summary

On January 19, 2012, the Kings County Association of Governments (Kings CAG) signed a memorandum of understanding (MOU) with the San Joaquin Valley Air Pollution Control District (District) to develop a communitywide greenhouse gas (GHG) emission inventory for the County of Kings.

The MOU requires a GHG emissions inventory be developed for a base year and forecasted year. During a pre-project kickoff meeting it was agreed that 2005 would be the base year and 2020 would be used as the forecast year. These inventories are summarized below and more detail is provided in the GHG Emissions Inventory Summary section.

As part of the District's GHG emissions inventory development process, five key principles (*Transparency, Consistency, Data Source Priority / Relevance, Accuracy, and Completeness)* were implemented to ensure that the best possible inventory was developed. To provide transparency to the process and to allow the County of Kings to update each individual emissions source as needed in the future; clear and detailed methodologies were developed and are included in Appendix A through I. For consistency, sources having similar data requirements and similar data availability utilized comparable methodologies. Throughout the inventory development process, priority was given to data provided by local sources (Kings County CAG or survey data from local businesses) versus state or national data. In completing the inventory process, the District deployed a multi-tiered quality assurance and quality check process for reviewing each of the methodologies to ensure consistency, accuracy and completeness.

The GHG emissions inventories were estimated for nine primary sectors (Electricity Production and Consumption, Residential/Commercial/Industrial Combustion, Transportation, Fossil Fuels Industry, Industrial Processes, Waste Management, Agriculture, Forestry and Land Use, and Other Sources). A detailed listing of all the sectors and subsectors are included in Table 2 of the report.

The 2005 base year GHG emissions inventory was estimated to be 2.9 million metric tons of CO_2 equivalents (CO_2e), of which the Agriculture - Livestock sector represents 48%, followed by Transportation and Electricity Consumption at 18% and 13%, respectively. The 2020 forecasted GHG emissions inventory was estimated to be 3.3 million metric tons of CO_2e, of which the Agriculture - Livestock sector represents 49%, followed by Transportation and Electricity Consumption at 16% and 14%, respectively. A detailed breakdown of each sector and subsector's emissions and contribution to the overall GHG emissions inventory is provided in Figures 1 and 2, and Tables 4 through 6 of the report.

GHG Background

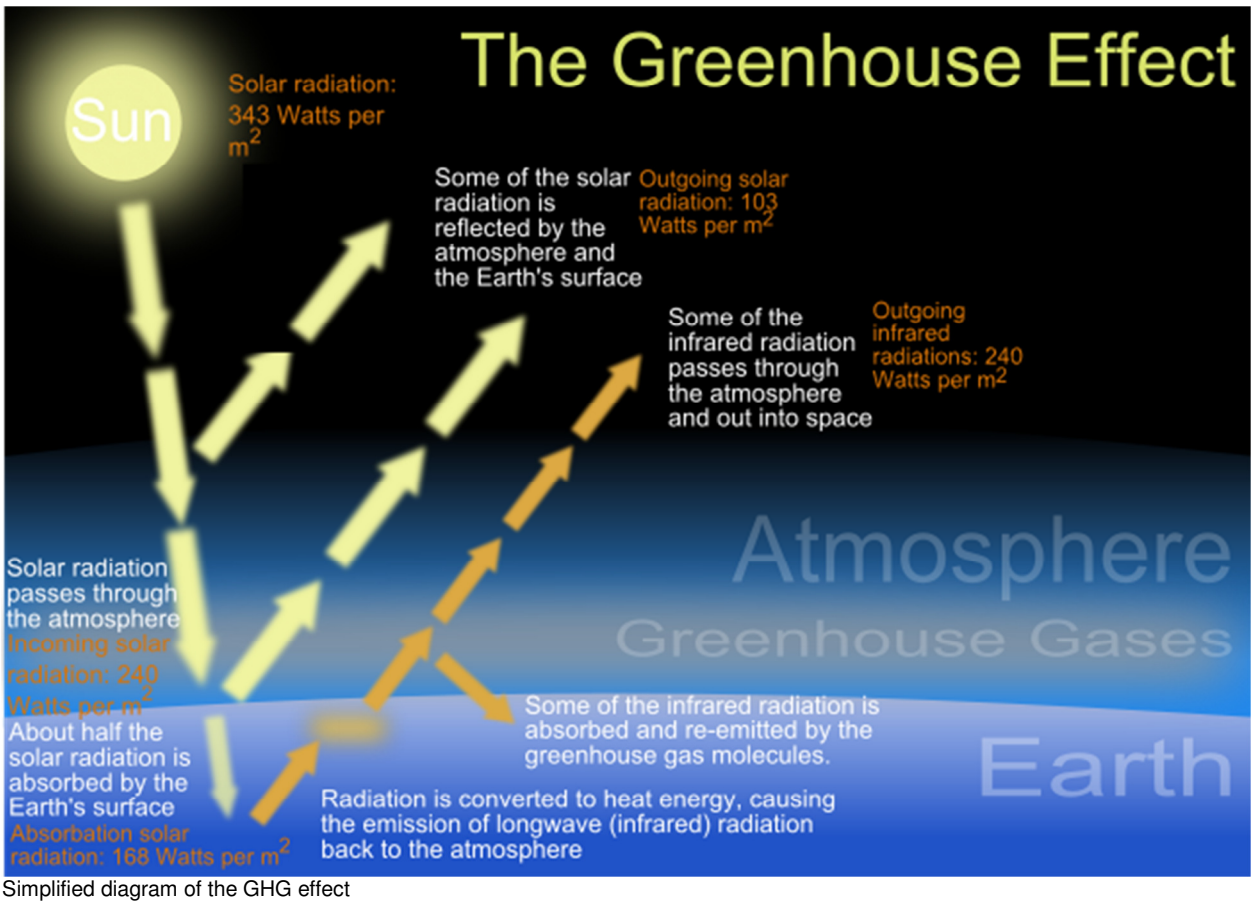
In 1988, the Intergovernmental Panel on Climate Change (IPCC) was created by the World Meteorological Organization and the United Nations Environment Program (UNEP). The IPCC issued a first assessment report in 1990 which reflected the views of 400 scientists and in 1995 IPCC published the second assessment report.

The Kyoto Protocol adopted in Kyoto, Japan, in 1997 is an international agreement linked to the United Nations Framework Convention on Climate Change (UNFCCC), with binding targets for 37 industrialized countries and the European community for reducing greenhouse gas (GHG) emissions.

In 2006, the California Legislature passed and Governor Schwarzenegger signed Assembly Bill 32 (AB 32), the Global Warming Solutions Act of 2006, which set the state's first greenhouse gas emissions reduction goal into law. AB 32 requires that the State reduce emissions to 1990 levels by the year 2020, and it directed the California Air Resources Board (CARB) to begin developing discrete early actions to reduce greenhouse gases while also preparing a scoping plan to identify how best to reach the 2020 target.

What is the "Greenhouse Effect" and "Global Warming".

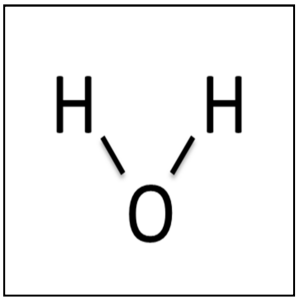
Atmospheric GHGs and clouds within the Earth's atmosphere influence the Earth's temperature by absorbing most of the infrared radiation rising from the Earth's sun-warmed surface that would otherwise escape into space, a process known as the "greenhouse effect". The resulting balance between incoming solar radiation and outgoing radiation from both the Earth's surface and atmosphere keeps the planet habitable. Current life on Earth could not be sustained without the natural greenhouse effect.


The Greenhouse Effect
Sun
Solar radiation: 343 Watts per m2
Some of the solar radiation is reflected by the atmosphere and the Earth's surface
Outgoing solar radiation: 103 Watts per m2
Some of the infrared radiation passes through the atmosphere and out into space
Outgoing infrared radiations: 240 Watts per m2
Atmosphere
Greenhouse Gases
Solar radiation passes through the atmosphere
Incoming solar radiation: 240 Watts per m2
About half the solar radiation is absorbed by the Earth's surface
Absorbation solar radiation: 168 Watts per m2
Some of the infrared radiation is absorbed and re-emitted by the greenhouse gas molecules.
Radiation is converted to heat energy, causing the emission of longwave (infrared) radiation back to the atmosphere
Earth
Simplified diagram of the GHG effect

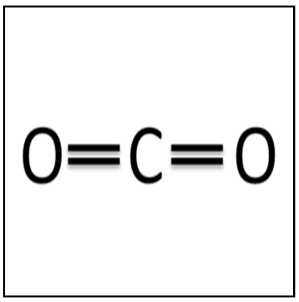
But the greenhouse effect is becoming stronger, and this increasing effect is generally thought to be as a result of human activities, primarily through the burning of fossil fuels for transportation and electricity generation, and the deforesting of large areas of land. The IPCC attributes humanity's global warming influence primarily to the increase of three key heat-trapping gases in the atmosphere: carbon dioxide, methane, and nitrous oxide. Human-produced emissions of these GHGs into the atmosphere enhance the greenhouse effect by absorbing additional radiation that would otherwise escape into space. This traps more heat in the atmosphere, causing temperatures to rise. This rise in global average temperatures is referred to as global warming. According to the IPCC, "most of the observed increase in global average temperatures since the mid-20th century is very likely due to the observed increase in anthropogenic GHG concentrations".

Some greenhouse gases such as water vapor occur naturally and are emitted to the atmosphere through natural processes as well as through human activities. As noted above, the most common GHG that results from human activity is carbon dioxide, followed by methane and nitrous oxide. GHGs as a whole can include:

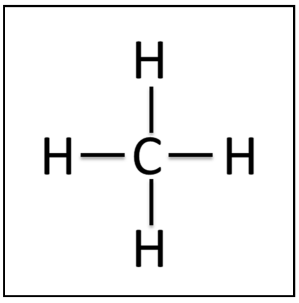
Water Vapor. Although not considered a pollutant, water vapor is the most important, abundant, and variable GHG. In the atmosphere, it maintains a climate necessary for life. The main source of water vapor is evaporation from the ocean (approximately 85 percent). Other sources include sublimation (change from solid to gas) from ice and snow, evaporation from other water bodies, and transpiration from plant leaves. Human activities are not thought to directly affect the average global concentration of water vapor.



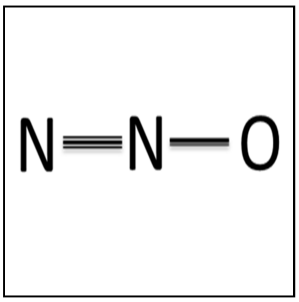
Carbon dioxide. Carbon dioxide (CO_2) is an odorless, colorless gas, which has both natural and anthropogenic sources. Natural sources include respiration of bacteria, plants, animals, and fungus; evaporation from oceans; volcanic out gassing; and decomposition of dead organic matter. Anthropogenic sources of carbon dioxide include the burning of coal, oil, natural gas, and wood. Concentrations of CO_2 were 379 parts per million (ppm) in 2005, which is an increase of 1.4 ppm per year since 1960.



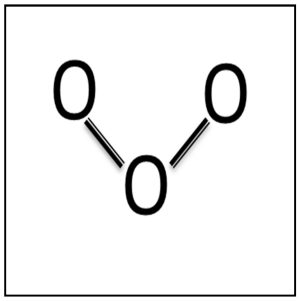
Methane. Methane (CH_4) is a flammable gas and is the main component of natural gas. When one molecule of CH_4 is burned in the presence of oxygen, one molecule of carbon dioxide and two molecules of water are released. There are no direct ill health effects from CH_4. Methane is primarily produced through anaerobic decomposition of organic matter in biological systems. Geological deposits, known as natural gas fields, also contain CH_4, which is extracted for fuel. Other sources are from cattle, fermentation of manure, and landfills.



Nitrous oxide. Nitrous oxide (N_2O), also known as laughing gas, is a colorless greenhouse gas. Higher concentrations of N_2O can cause euphoria, dizziness, and slight hallucinations. N_2O is produced by microbial processes in soil and water, including those reactions that occur in fertilizer containing nitrogen. In addition to agricultural sources, some industrial processes (nitric acid production, nylon production, fossil fuel-fired power plants, and vehicle emissions) also contribute to the nitrous oxide atmospheric load. It is used in racecars, rocket engines, and as an aerosol spray propellant.

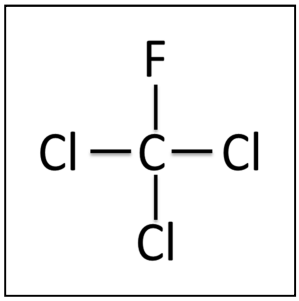


Ozone. Ozone is present in both the upper stratosphere, where it shields the Earth form ultraviolet radiation, and at lower concentrations in the lower atmosphere, where it is the main component of photochemical smog. Unlike other GHGs, ozone is relatively short- lived and, therefore, is not global in nature. It is difficult to make an accurate determination of the contribution of ozone precursors (nitrogen oxides and volatile organic compounds) to global climate change.



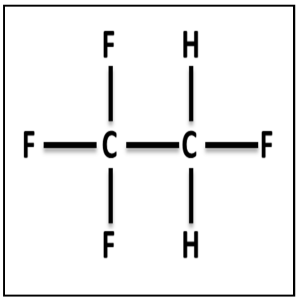
Halocarbons. Halocarbons are synthetically produced gases in which one or more of the hydrogen atoms in a hydrocarbon has been replaced by a halogen (primarily fluorine, chlorine, or bromine). For regulatory purposes, halocarbons are classified as either ozone depleting, or non-ozone depleting.

- **Ozone depleting halocarbons**. Ozone depleting halocarbons include hydrocarbons where one or more hydrogen atoms have been replaced by chlorine (chlorofluorocarbons or CFCs; hydrochlorofluorocarbons or HCFCs; methylchloride; and carbon tetrachloride) or bromine (methyl bromide; hydrobromofluorocarbons or HBFCs). The halocarbons have the ability to react with ozone in the stratosphere and degrade it. Since stratospheric ozone is a greenhouse gas, this results in a reduction in global warming potential. However, many of these ozone depleting halocarbons are potent greenhouse gasses themselves, so the net effect is uncertain. Ozone depleting halocarbons are regulated under provisions of the Montreal Protocol and subsequent Copenhagen Amendments. As a signatory, the United States agreed to phase out production and importation of these compounds. Although some of these compounds are potent greenhouse gasses, they are not covered by the United Nations Framework Convention on Climate Change (UNFCCC).

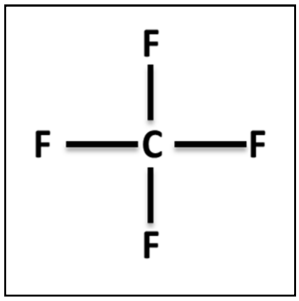


- **Non-Ozone depleting halocarbons.** Some halocarbons are powerful greenhouse gasses and are not regulated by the Montreal Protocol. These include the hydrofluorocarbons (HFCs) and perfluorocarbons (PFCs).

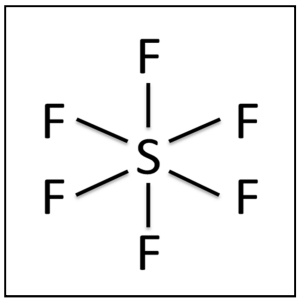
  - **Hydrofluorocarbons**. Hydrofluorocarbons (HFCs) are man-made organic compounds that contain only one or a few fluorine atoms. HFCs include compounds such as Freon 134a that are used as a substitute for ozone depleting refrigerants.



- **Perfluorocarbons**. Perfluorocarbons (PFCs) have stable molecular structures and do not break down through the chemical processes in the lower atmosphere. High-energy ultraviolet rays, roughly 60 lulometers above the earth's surface are able to destroy the compounds. PFCs have long lifetimes, ranging between 10,000 and 50,000 years. Two common PFCs are tetrafluoromethane and hexafluoroethane. Concentrations of tetrafluoromethane in the atmosphere are over 70 parts per trillion (ppt). The two main sources of PFCs are primary aluminum production and semiconductor manufacture.



- **Sulfur hexafluoride**. Sulfur hexafluoride (SF_6) is an inorganic, colorless, odorless, nontoxic, nonflammable gas. Concentrations in the 1990s were roughly 4 ppt. SF_6 is used for insulation in electric power transmission and distribution equipment, in semiconductor manufacturing, the magnesium industry, and as a tracer gas for leak detection.



Others. A number of other gasses have indirect effects on global warming. These include:

- Carbon monoxide (CO) which can interfere with the natural atmospheric decomposition of methane and tropospheric ozone.
- Nitrogen oxides (NOx) and non-methane volatile organic compounds (NMVOCs) which promote the formation of ozone.
- Aerosols which can warm the atmosphere by absorbing and emitting heat, and can cool the atmosphere by reflecting light. Regulation has been lowering concentrations of these pollutants in the United States; however, global concentrations are likely increasing.

Global Warming Potential (GWP)

Under Assembly Bill 32 (AB 32) GHGs are defined as carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), sulfur hexafluoride (SF6), hydrofluorocarbons (HFCs), and perfluorocarbons (PFCs). The global warming potential (GWP) of the various GHGs is assigned as a measure of their relative average global radiative forcing effect, the potential of a gas or aerosol to trap heat in the atmosphere. Individual GHG species have varying GWP and atmospheric lifetimes. The carbon dioxide equivalent is a consistent methodology for comparing GHG emissions since it normalizes various GHG emissions to a single metric. The reference gas for GWP is carbon dioxide with a GWP of one and GWP weighted emissions are measured in terms of CO_2 equivalent (CO_2e). For example, methane has a GWP of 21; methane has a 21 times greater global warming effect than carbon dioxide on a weight basis. Several GWPs of other GHGs are shown in Table 1 below:

Table 1. Global warming potentials (100 year time horizon) as reported in the IPCC Second Assessment Report (SAR).

Greenhouse Gas	Abbreviation	Global Warming Potential
Carbon Dioxide	CO_2	1
Methane	CH_4	21
Nitrous Oxide	N_2O	310
Trifluoromethane	HFC-23	11,700
Difluoromethane	HFC-32	650
Pentafluoroethane	HFC-125	2,800
1,1,1,2-tetrafluoroethane	HFC-134a	1,300
1,1,1-trifluoroethane	HFC-143a	3,800
1,1-difluoroethane	HFC-152a	140
1,1,1,2,3,3,3- heptafluoropropane	HFC-227ea	2,900
1,1,1,3,3,3-hexafluoropropane	HFC-236fa	6,300
1,1,1,2,2,3,4,5,5,5- decafluoropentane	HFC-4310mee	1,300
Perfluoromethane (tetrafluoromethane)	CF_4	6,500
Perfluoroethane (hexafluoroethane)	C_2F_6	9,200
Perfluorobutane (decafluorobutane)	C_4F_{10}	7,000
Perfluorohexane (tetradecafluorohexane)	C_6F_{14}	7,400
Sulfur hexafluoride	SF_6	23,900

California GHG Legislation

AB 32 Timeline

- **By Jan 1, 2009** - CARB adopts plan indicating how emission reductions will be achieved from significant sources of GHGs via regulations, market mechanisms and other actions.
- **During 2009** - CARB staff drafts rule language to implement its plan and holds a series of public workshop on each measure (including market mechanisms).
- **By Jan 1, 2010** - Early action measures take effect.
- **During 2010** - CARB conducts a series of rulemakings, after workshops and public hearings, to adopt GHG regulations including rules governing market mechanisms.
- **By Jan 1, 2011** - CARB completes major rulemakings for reducing GHGs including market mechanisms. CARB may revise the rules and adopt new ones after 1/1/2011 in furtherance of the 2020 cap.
- **By Jan 1, 2012** - GHG rules and market mechanisms adopted by CARB take effect and are legally enforceable.
- **December 31, 2020** - Deadline for achieving 2020 GHG emissions target.

Air Resources Board Scoping Plan

The California Air Resources Board's (CARB) Climate Change Scoping Plan establishes the foundations for how the State will achieve the GHG emissions targets set in Assembly Bill 32 (AB 32). AB 32 requires that the State reduce emissions to 1990 levels by the year 2020. CARB prepared a 1990 and 2020 GHG inventory and identified that the State will need to reduce GHG emissions by approximately 30 percent from business-as-usual (BAU) by 2020 to achieve the 2020 target of AB 32, which correlates to approximately a 15 percent reduction from existing conditions at the time the Scoping Plan was adopted (2002-2004 emissions inventory). Because local land use decisions affect how people relate to their environment, CARB recommends that cities and counties adopt a similar GHG reduction goal. Actions taken by CARB and other State agencies, including, but not limited to, the California Energy Commission (CEC) and Public Utilities Commission (CPUC), are the primary drivers behind the statewide mandatory GHG reduction measures that are being implemented to date. While actions of counties and cities were not calculated, or included in the list of actions to achieve the target of AB 32 in the Scoping Plan, local actions are important to the success of long-term GHG reductions in the State.

Local Agencies

Reducing GHG emissions from the transportation sector will be critical to the success of statewide GHG reductions. Transportation emissions account for about 38 percent of the statewide GHG emissions inventory, and passenger vehicles account for about 74 percent of the total transportation sector emissions. While much transportation planning takes place on a regional level, land-use changes occurring on a local level can also improve transportation and reduce overall GHG emissions. Based on this principal, Senate Bill 375 (SB375) was adopted to reduce passenger vehicle miles traveled and associated GHG emissions. GHG reduction measures associated with implementation of SB375 are under the purview of California's 18 Metropolitan Planning Organizations (MPOs). GHG emission reduction targets of 7 to 8 percent in 2020 and between 13 to 16 percent in 2035 from 2005 base year for the MPOs was adopted by CARB on September 29, 2010.

MPOs are required to identify strategies to reduce passenger vehicle miles traveled (VMT) and trips that achieve these targets in a Sustainable Communities Strategies (SCS). If the SCS is unable to achieve the regional GHG emissions reduction targets, then the MPO is required to prepare an Alternative Planning Strategy (APS) that shows how the GHG emissions reduction target could be achieved through alternative development patterns, infrastructure, and/or transportation measures. MPOs have no land use authority at the local level as the majority of land use decisions are vested with local governments. Therefore, local-level participation in regional efforts will be critical to the success of any SCS or APS.

Inventory Development Basics

For community-scale inventories [Local Government Operations (LGO), communitywide (city, county, or region)], emissions can be categorized according to the degree of control community members, organizations, or agencies have over the emissions sources. These categorizations (developed by the World Resources Institute and the World Business Council for Sustainable Development) are called emissions scopes. The scopes framework helps communities to:

- Determine which emissions should be inventoried.
- Organize emissions by degree of control and therefore the potential for reduction.
- Avoid "double counting" of emissions, i.e., summing up of different emissions sources that may result in reporting these emissions twice.

The emissions scopes are defined as follows:

> **Scope 1**: All direct emissions sources located within the geopolitical boundary of the agency. This includes stationary combustion to produce electricity, steam, heat, and power equipment; mobile combustion of fuels; process emissions from physical or chemical processing; fugitive emissions that result from production, processing, transmission, storage and use of fuels; leaked refrigerants; and other sources.
>
> **Scope 2**: Indirect emissions that result as a consequence of activity within the local government's geopolitical boundary limited to electricity, district heating, steam and cooling. Electricity purchased from a utility that lies inside or outside the geopolitical boundary is considered Scope 2.
>
> **Scope 3**: All other indirect and embodied emissions that occur as a result of activities within the geopolitical boundary are included as Scope 3. Scope 3 emission sources include (but are not limited to) emissions resulting from the decomposition of community-generated solid waste, materials flows and other lifecycle analyses.

Note that emission inventories are, by nature, the reflection of the best available data and the most applicable methods at the time of their compilation. As data grow and understanding develops they can and should be updated and improved.

Inventory Purpose

The objective of a communitywide inventory is to identify the sources and quantities of greenhouse gas emissions resulting from activities within a jurisdiction in a chosen base year (see below for more on base year). The communitywide inventory is a necessary first step in addressing greenhouse gas emissions, serving two primary purposes:

- To create an emissions baseline against which your jurisdiction can set emissions reduction targets and measure future progress.
- To provide insight into the scale of emissions from the various sources within the community, underpinning informed and strategic emissions reductions, commonly called "climate action planning."

Conducting a communitywide inventory is the first step to an emissions reduction strategy. Communitywide emission inventories are important for a variety of reasons including:

- A local agency has direct control over a significant portion of the emissions that emanate from the community at large.
- A local agency can implement programs to engage the community in numerous ways including education, energy efficiency, waste diversion programs, etc.
- State legislation may soon require community inventories.

Energy efficiency measures can save the community money. Within the context of community activities, local agencies have direct control over their emissions-generating activities and influence over numerous actions taken by residents, businesses and industries. A local agency can reduce energy consumption in buildings and facilities, promote programs to reduce the number of vehicles on the road, inform residents about energy saving programs, work with utilities to provide clean energy options, improve programs that divert recyclables and compostables from the waste stream, and much more. By quantifying the emissions generated by the community, the local jurisdiction will be empowered to choose the most effective approach to reducing its contribution to greenhouse gas emissions. The process of conducting such a quantitative analysis is called a communitywide emissions inventory.

Since the District is not is a position to pre-determine the sources of emissions over which Kings County has control, this inventory intends to provide information on as many sources of greenhouse gas emissions as is practicable.

Inventory Boundaries

It is important to note that the communitywide inventory is designed to represent the total quantity of greenhouse gas emissions produced by the community under evaluation as defined by its geographical borders during a given year. Emissions from LGO operations are already embedded in the communitywide inventory. For example, aggregate data for commercial energy used by the communitywide inventory includes energy used for municipal buildings and facilities; communitywide vehicle miles traveled estimates include miles driven by municipal fleet vehicles; and total tons of solid waste landfilled by the community includes municipal waste. Although LGO inventories on occasion include Scope 3 activities that occur outside the geographic communitywide boundary, the LGO inventory can be considered a subset of the communitywide inventory. It is also important to note that, although LGO emissions are incorporated into the communitywide inventory, they cannot be segregated from the community's emissions due to the large scale data sources upon which a communitywide inventory is based. For that reason, LGO inventories must be completed separately from communitywide inventories.

For this communitywide inventory, the Kings County Association of Governments determined that the domain would be the geographical boundary of Kings County. Therefore, this inventory includes all sources within the county, including those on State and Federal lands. The exception to this is that military aircraft operations are presented as an informational item and not included in the County's emissions total.

Inventory Sectors

The purpose of this section is to help understand the sectors that may be included in a communitywide inventory. When proposing to conduct a communitywide inventory the following questions should be considered:

- What scopes is the inventory going to cover?
- What sectors are to be included in the inventory?
- What is the purpose of the inventory? (Required by regulation, support an agency's climate change planning efforts, etc.)

It is important to note that a communitywide emissions inventory based upon the sectors identified below will differ from project level emissions inventories prepared for California Environmental Quality Act (CEQA) or for Local Government Operations (LGO) purposes. For example, a CEQA GHG emissions inventory prepared for a wind farm project may contain greenhouse gas emission estimates from construction (off-road vehicles and equipment), and operation (off-road vehicles and equipment, on-road vehicles, and backup generators). On the other hand, when addressing a sector based communitywide emissions inventory, the appropriate *Transportation* subsectors would include all of the mobile sources emissions (on-road and off-road vehicle) and the *In-County Electricity Production/Renewable* subsector would include the emissions associated with the production of electricity only. For instance, for a wind farm, the emissions associated with the production of electricity would be insignificant.

For this communitywide emissions inventory, the sectors selected and structure are consistent with the inventories prepared by the District for Kern County (SJVAPCD, 2012), and by the Center for Climate Strategies for the Southern California Association of Governments (CCS, 2010). Table 2 below describes the nine primary sectors and 69 subsectors that are included in this inventory. In addition, the category's scope and a cross references to Intergovernmental Panel on Climate Change category codes are also provided. This data will allow for cross reference to other systems of source classification, such as the new the International Council for Local Environmental Initiatives (ICLEI) protocol released in October of 2012 (ICLEI, 2012), as they are developed.

Table 2 – GHG Inventory Sectors and Subsectors

Sector ID	Sector Name and Subsector ID			Scope	IPCC Category Code
A.	**Electricity**				
	1.	In-County Electricity Production			
		a.	Coal/Coke	1	1A1a
		b.	Natural Gas		
		c.	Petroleum		
		d.	Waste/Biogas		
		e.	Renewable		
	2.	In-County Electricity Consumption		2	--
B.	**Residential/Commercial/Industrial Combustion**				
	1.	Residential			
		a.	Coal/Coke	1	1A4b
		b.	Natural Gas		
		c.	Oil		
		d.	Wood		
		e.	LPG		
		f.	Kerosene		
	2.	Commercial			
		a.	Coal/Coke	1	1A4a
		b.	Natural Gas		
		c.	Oil		
		d.	Wood		
		e.	LPG		
	3.	Industrial			
		a.	Coal/Coke	1	1A2
		b.	Natural Gas		
		c.	Oil		
		d.	Wood		
		e.	LPG		
C.	**Transportation**				
	1.	On-road Gasoline		1	1A3b
	2.	On-road Diesel			1A3b
	3.	Off-road Gasoline			1A3e
	4.	Off-road Diesel			1A3e
	5.	On-road CNG			1A3b
	6.	On-road LPG			1A3b
	7.	Marine Vessels/Water Craft			1A3e
	8.	Rail			1A3c
	9.	Airports			1A3a

Sector ID	Sector Name and Subsector ID			Scope	IPCC Category Code
D.	**Fossil Fuels Industry**				
	1.	Oil & Gas Industry - Combustion			
		a.	Natural gas & waste gas	1	1A1b
		b.	Residual oil		
		c.	LPG		
	2.	Fugitives – Fossil Fuels Industry			1B2
	3.	Venting - Fossil Fuels Industry			1B2
	4.	Fugitives - Natural Gas Transmission/Distribution			1B2biii
	5.	Refining Processes			1B2
E.	**Industrial Processes**				
	1.	Cement Manufacturing		1	2A1
	2.	Lime Manufacturing			2A2
	3.	Semiconductor Manufacturing			2E1
	4.	Substitutes for Ozone Depleting Substances (ODS)			2F
	5.	SF_6 from Electrical Distribution and Transmission			2G1
	6.	CO_2 Consumption			2G4
	7.	Limestone & Dolomite Consumption			2G4
	8.	Soda Ash Consumption			2G4
	9.	Hydrogen Production			2H3
	10.	Coal Mining Operations			1B1a
F.	**Waste Management**				
	1.	Landfills		1 & 3	4A
	2.	Wastewater Management			4D
G.	**Agriculture**				
	1.	Livestock		1	
		a.	Enteric Fermentation		3A1
		b.	Manure Management		3A2
		c.	Ag Soils - Livestock		3C4-5
	2..	Non-Livestock			
		a.	Ag Soils - Liming		3C2
		b.	Ag Soils - Fertilizer		3C3-5
		c.	Ag Soils - Crops		3B2
		d,	Ag Burning		3C1b
		e.	Fuel Combustion		1A4c
		f.	Ag Carbon Flux		3B2

Sector ID	Sector Name and Subsector ID		Scope	IPCC Category Code
H.	**Forestry and Land Use**			
	1.	Forested Landscape	1	3B1
	2.	Non-Farm Fertilizer (Settlement Soils)		3B5
	3.	Wildfires		3B1
	4.	Range Improvement		3B1
	5.	Prescribed Burn		3B1
	6.	Hazard Reduction Burn		3C1d
I.	**Other Sources**			
	1.	Composting	3	4B
	2.	Resource Recovery		--
	3.	Urban Forests		3B5
	4.	Military Bases (Aircraft)		1A5
	5.	Nitrogen Deposition		5A

Inventory Baseline Year

Part of the communitywide inventory process requires the selection of a baseline year for the focus of the analysis. This year will provide a "performance datum" against which you will be able to compare current and future emissions or to track a community's progress in reducing GHGs. To establish a base year one should examine the range of data available and select a year that has the most accurate and complete data for all key emission sources. Other considerations may play a part in selecting a base year. For example, a base year may be selected based on a regulator-determined year or it may be established several years in the past to be able to account for the emissions benefits of recent actions. A communitywide inventory should comprise all greenhouse gas emissions occurring during the selected calendar year.

Many California agencies have chosen to use 2005 as a baseline year – this is increasingly becoming the standard for inventories in the state. Due to a lack of available data, a 1990 baseline year is usually difficult for most local governments to complete and would not produce as accurate an inventory. For this communitywide inventory, the Kings County Association of Governments determined that the inventory baseline year would be 2005.

Inventory Forecasting

To forecast future year emissions, estimates of the changes in the level of emission producing activities, known as "activity indicators", are used to grow the base year emissions inventory. In addition, emission reductions resulting from rules and regulations adopted by an agency or from statewide regulations adopted by the California Air Resources Board (CARB) are estimated and accounted for in the future year projection.

Forecasting quantities of emissions in future years is accomplished by assuming that the amount of emissions is related to activity levels of a selected ***activity indicator***.

Examples of activity indicators include human population, housing, employment, oil production, livestock populations, and daily vehicle miles traveled. The Kings County Association of Governments is a source of several activity indicators. The California Air Resources Board, and other state and local agencies also contributed activity data. These data represent the best available estimates of future activity levels for the county. The ***activity factor or growth factor*** is the ratio of the 2020 forecast levels of activity to the 2005 base year level of activity. A growth factor greater than one would indicate an increase in growth; while a growth factor of less than one would indicate a decline in activity relative to 2005.

To forecast a future year's uncontrolled emissions, the quantity of emissions from each sector in 2005 is multiplied by the growth factor of its assigned activity indicator. The assignments of activity indicators to emission sector are documented in Appendix A through I. Note that with the exception of the on-road vehicle transportation category, future year emissions forecasts do not reflect pending emissions reduction measures such as the Low Carbon Fuel Standard, the Renewable Portfolio Standard, or the Title 24 Building Energy Efficiency Standard. For on-road vehicles, the Pavley I and the Low Carbon Fuel Standard were accounted for using the California Air Resources Board's ONROAD2011 software

For this communitywide inventory, the Kings County Association of Governments determined that the inventory forecast year would be 2020. Note that some source categories (cement manufacturing, for instance) could not be found to operate in Kings County in the inventory base year. When this occurred, the base year emissions were set to zero. For these categories, if it was confirmed that there was still no activity in the current year, a future year estimate of zero emissions was forecast.

GHG Emissions Inventory Summary

Both the base year and the forecasted GHG emissions inventories were developed by collection of data for nine primary sectors which are made-up of 69 subsectors, as listed in Table 2 above. Emissions inventory methodologies were developed for each subsector and are presented in Appendix A through I. Note that emissions estimates have been rounded to the nearest ton prior to calculation of carbon dioxide equivalent emissions (CO_2e). This rounding practice has the potential to introduce a difference of less than 0.3% into the estimate, which is not considered significant.

Baseline GHG Emissions Inventory

The base year GHG emissions inventory was developed using 2005 as the baseline year for consistency with other agencies and state regulations. Data was collected from a variety sources (county departments, internal / external agencies, businesses, and organizations) to develop each methodology found in Appendix A through I. The resulting GHG emissions have been summarized by sector and are presented in Table 3, below.

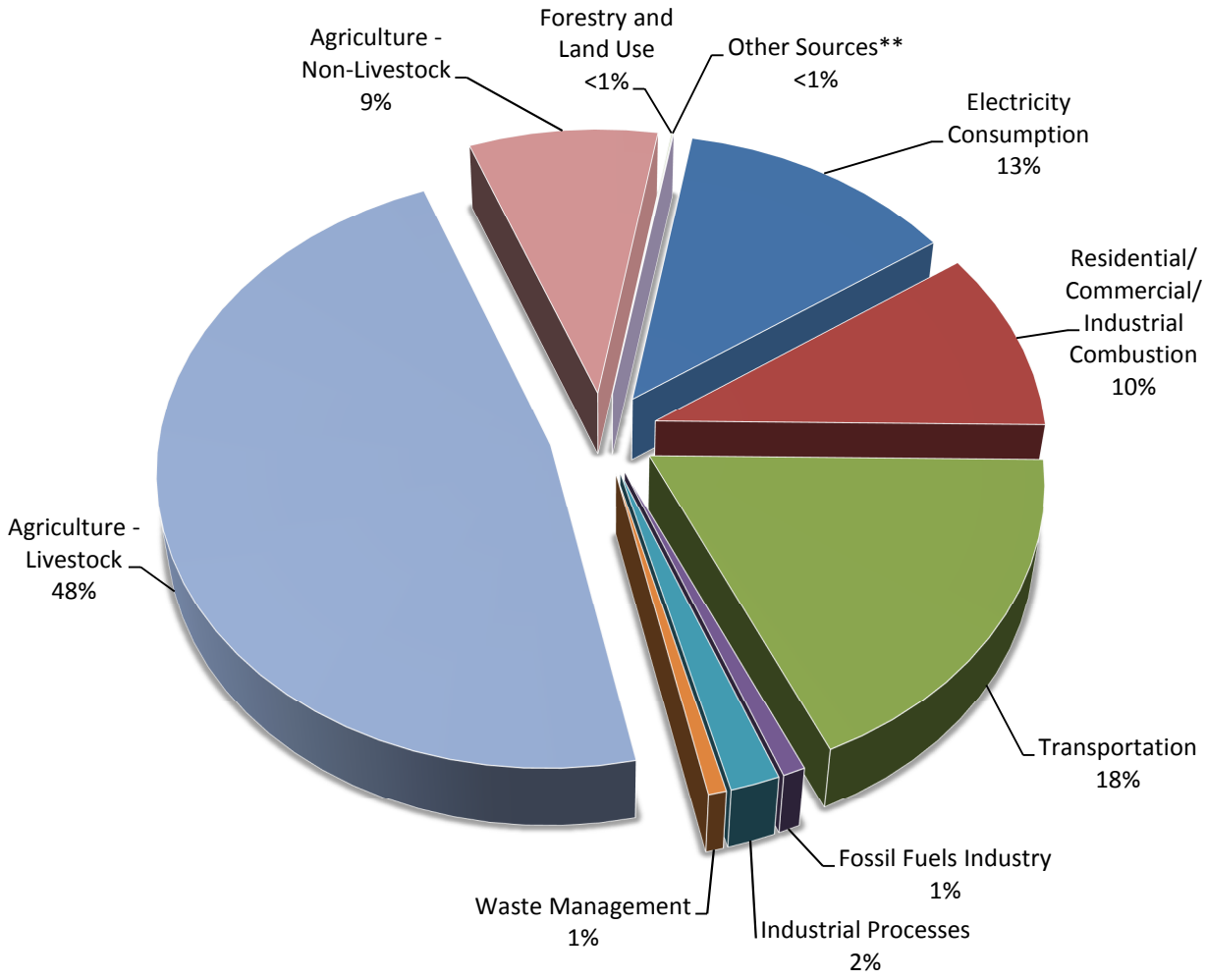
Table 3 - *Countywide GHG emissions inventory for 2005*

Sector ID	Sector Name	Metric Tons of CO_2e	Percent of Total
Total County 2005		**2,865,067***	
A	Electricity Production	234,027**	
	Electricity Consumption	358,694	13%
B	Residential/ Commercial/ Industrial Combustion	283,536	10%
C	Transportation	516,467	18%
D	Fossil Fuels Industry	24,446	1%
E	Industrial Processes	53,745	2%
F	Waste Management	19,562	1%
G	Agriculture - Livestock	1,361,651	48%
	Agriculture – Non-Livestock	244,176	9%
H	Forestry and Land Use	1,550	<1%
I	Other Sources***	1,240	<1%
County Total Sequestration		**134,896**	
G	Agriculture	42,565	32%
H	Forestry and Land Use	0	0%
I	Other Sources	92,331	68%

** Does not include the subtraction of sequestering sectors*
*** Included for completeness only, not included in further descriptions of the County's emissions.*
****Does not include emissions from military aircraft since they are not within the County's scope.*

Data presented in Table 3 for the Electricity Production sector are included here for completeness only and were not included when determining the county's total GHG emissions. Electricity Production includes emissions assigned to electricity consumption from within and outside of the county. Whereas Electricity Consumption only includes electricity consumed within the county. Emissions associated with electricity consumed outside of the county would be reported by the end user. Therefore, to ensure that emissions from Electricity Production & Consumption are not counted twice, the Electricity Production sector will not be included when describing the County's total GHG inventory.

Figure 1 – 2005 Greenhouse Gas Emissions Inventory by Sector*



*Does not include those subsectors that sequester greenhouse gasses in the Agriculture, Forestry and Land Use, and Other Source sectors. These subsectors sequester or consume carbon and are considered reductions.
**Does not include emissions from military aircraft.

Forecasted GHG Emissions Inventory

The forecasted 2020 GHG emissions inventory was developed by applying methodology specific growth factor to each of the 2005 base year estimates. A growth factor is a means by which a known value can be projected forward to a given year based on a given indicator, such as a county's population, the number of jobs in a given sector, or other economic factors.

During the methodology development process each approach was evaluated to determine the appropriate growth activity data to be used to develop the 2020 forecasted GHG emission inventory. The resulting 2020 forecasted GHG emissions have been summarized by sector and are presented in Table 4, below.

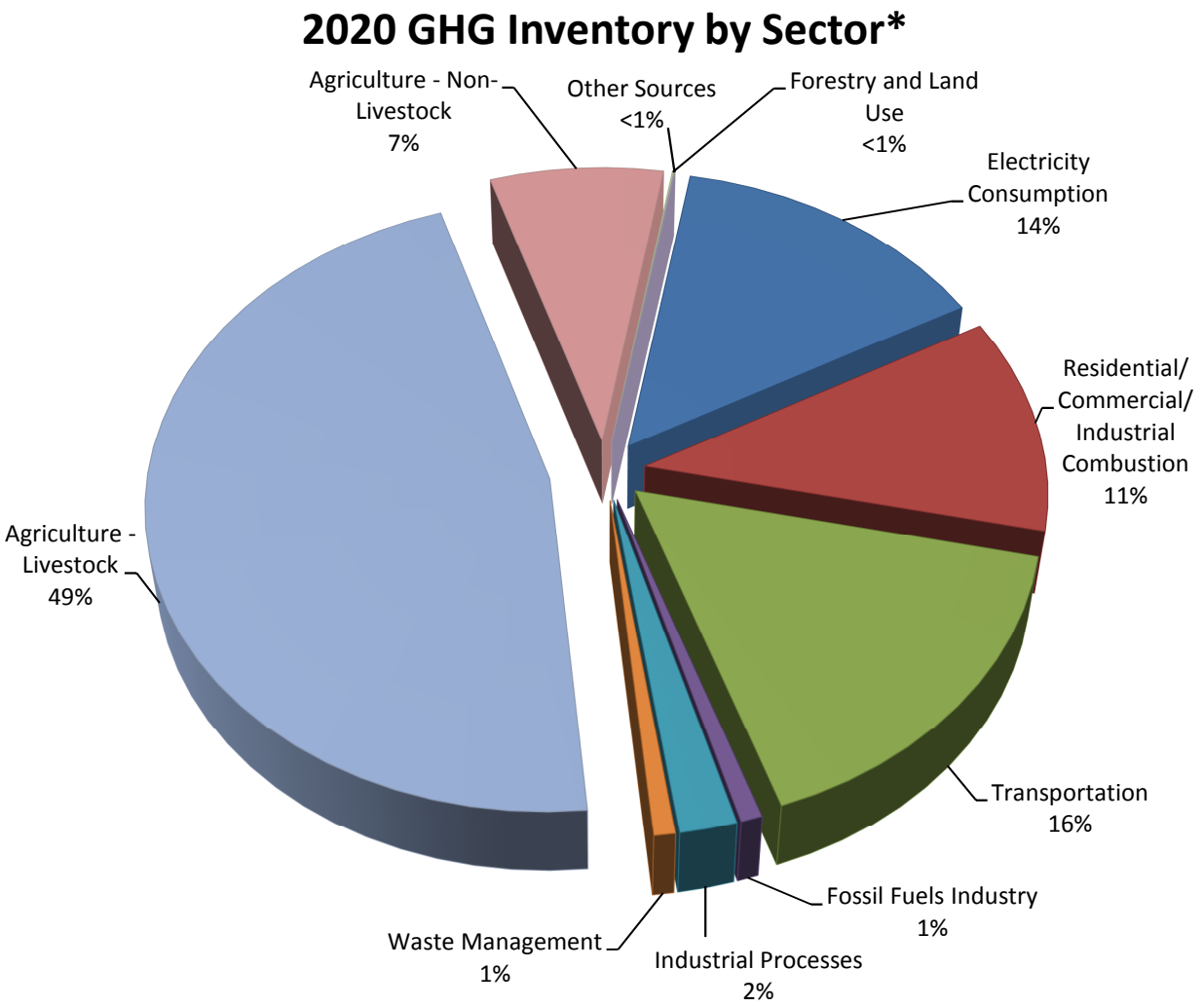
Table 4 - *Countywide Forecasted GHG emissions inventory for 2020*

Sector ID	Sector Name	Metric Tons of CO_2e	Percent of Total
Total County 2020		**3,289,166***	
A	Electricity Production**	292,936	
	Electricity Consumption	448,985	14%
B	Residential/ Commercial/ Industrial Combustion	364,106	11%
C	Transportation	516,960	16%
D	Fossil Fuels Industry	25,470	1%
E	Industrial Processes	67,274	2%
F	Waste Management	25,221	1%
G	Agriculture – Livestock	1,596,684	49%
	Agriculture – Non-Livestock	240,974	7%
H	Forestry and Land Use	1,940	<1%
I	Other Sources***	1,552	<1%
County Total Sequestration		**157,593**	
G	Agriculture	42,021	27%
H	Forestry and Land Use	0	0%
I	Other Sources	115,572	73%

** Does not include the subtraction of sequestering sectors*
*** Included for completeness only, not included in further descriptions of the County's emissions.*
****Does not include emissions from military aircraft since they are not within the County's scope.*

Table 4 shows that a largest proportion of Kings County's 2020 Forecasted GHG emissions are attributed to Agriculture. A detailed accounting of each sector and subsector is provided in Table 5 below.

Figure 2 – 2020 GHG Emissions Inventory by Sector*



*Does not include those subsectors that sequester greenhouse gasses in the Agriculture, Forestry and Land Use, and Other Source sectors. These subsectors sequester or consume carbon and are considered reductions.
**Does not include emissions from military aircraft.

Detailed GHG Emissions Inventory by Sector and Subsector

This section provides a detailed accounting of the 2005 base year and 2020 forecasted GHG emissions inventories prepared for the County of Kings. For a detailed explanation of each subsector and how emissions were derived for each, please refer to Appendix A through I.

Table 5. Detailed accounting for the 2005 base year and 2020 forecasted year by sector and subsector.

Sector ID	Sector Name and Subsector ID			Metric Tons of CO_2e		Increase/Decrease 2005 to 2020	
				2005	2020	Metric Tons of CO_2e	Percent
Total County*				**2,865,067**	**3,289,166**	**424,098**	**15%**
A.	**Electricity****			**358,694**	**448,985**	**90,291**	**25%**
	1.	In-County Electricity Production***		234,027	292,936	58,909	25%
		a.	Coal/Coke	210,148	263,047	52,899	25%
		b.	Natural Gas	23,879	29,889	6,010	25%
		c.	Petroleum	0	0	0	0%
		d.	Waste/Biogas	0	0	0	0%
		e.	Renewable	0	0	0	0%
	2.	In-County Electricity Consumption		358,694	448,985	90,291	25%
B.	**Residential/Commercial/Industrial Combustion**			**283,536**	**364,106**	**80,570**	**28%**
	1.	Residential					
		a.	Coal/Coke	0	0	0	0%
		b.	Natural Gas	78,521	98,286	19,765	25%
		c.	Oil	100	125	25	25%
		d.	Wood	294	294	0	0%
		e.	LPG	7,422	9,290	1,868	25%
		f.	Kerosene	192	240	48	25%
	2.	Commercial					
		a.	Coal/Coke	58	73	15	26%
		b.	Natural Gas	63,590	80,099	16,509	26%
		c.	Oil	1,298	1,635	337	26%
		d.	Wood	105	132	27	26%
		e.	LPG	836	1,053	217	26%
	3.	Industrial					
		a.	Coal/Coke	11,061	14,584	3,523	32%
		b.	Natural Gas	104,459	137,727	33,268	32%
		c.	Oil	14,529	19,156	4,627	32%
		d.	Wood	63	83	20	32%
		e.	LPG	1,008	1,329	321	32%
C.	**Transportation**			**516,467**	**516,960**	**493**	**0%**
	1.	On-road Gasoline		240,595	209,255	-31,340	-13%
	2.	On-road Diesel		224,507	247,851	23,344	10%
	3.	Off-road Gasoline		6,635	7,475	840	13%
	4.	Off-road Diesel		Included in combustion sectors			
	5.	On-road CNG		4,556	6,019	1,463	32%
	6.	On-road LPG		777	1,026	249	32%
	7.	Marine Vessels/Water Craft		273	308	35	13%
	8.	Rail		28,025	31,133	3,108	11%
	9.	Airports		11,099	13,893	2,794	25%

Sector ID	Sector Name and Subsector ID			Metric Tons of CO_2e		Increase/Decrease 2005 to 2020	
				2005	2020	Metric Tons of CO_2e	Percent
D.	**Fossil Fuels Industry**			**24,446**	**25,470**	**1,024**	**4%**
	1.	Fossil Fuels Industry - Combustion					
		a.	Natural gas & waste gas	4,570	2,713	-1,857	-41%
		b.	Residual oil	0	0	0	0%
		c.	LPG	0	0	0	0%
	2.	Fugitives – Fossil Fuels Industry		2,501	1,680	-821	-33%
	3.	Venting – Fossil Fuels Industry		1,184	810	-374	-32%
	4.	Fugitives - Natural Gas Transmission/Distribution		16,191	20,267	4,076	25%
	5.	Refining Processes		0	0	0	0%
E.	**Industrial Processes**			**53,745**	**67,274**	**13,529**	**25%**
	1.	Cement Manufacturing		0	0	0	0%
	2.	Lime Manufacturing		0	0	0	0%
	3.	Semiconductor Manufacturing		0	0	0	0%
	4.	Substitutes for Ozone Depleting Substances (ODS)		47,249	59,143	11,894	25%
	5.	SF_6 from Electrical Distribution and Transmission		4,610	5,770	1,160	25%
	6.	CO_2 Consumption		640	801	161	25%
	7.	Limestone & Dolomite Consumption		0	0	0	0%
	8.	Soda Ash Consumption		1,246	1,560	314	25%
	9.	Hydrogen Production		0	0	0	0%
	10.	Coal Mining Operations		0	0	0	0%
F.	**Waste Management**			**19,563**	**25,221**	**5,659**	**29%**
	1.	Landfills		11,394	15,383	3,989	35%
	2.	Wastewater Management		8,168	9,838	1,670	20%
G.	**Agriculture****			**1,605,827**	**1,837,658**	**231,831**	**14%**
	1.	Livestock					
		a.	Enteric Fermentation	608,139	712,242	104,103	17%
		b.	Manure Management	580,842	687,911	107,069	18%
		c.	Ag Soils - Livestock	172,670	196,531	23,861	14%
	2.	Non-Livestock					
		a.	Ag Soils - Liming	3,283	3,241	-42	-1%
		b.	Ag Soils - Fertilizer	180,776	178,464	-2,312	-1%
		c.	Ag Soils - Crops	47,430	46,823	-607	-1%
		d.	Ag Burning	2,111	2,084	-27	-1%
		e.	Fuel Combustion	10,576	10,362	-214	-2%
		f.	Carbon Flux	-42,565	-42,021	544	-1%

Sector ID	Sector Name and Subsector ID		Metric Tons of CO_2e		Increase/Decrease 2005 to 2020	
			2005	2020	Metric Tons of CO_2e	Percent
H.	**Forestry and Land Use****		**1,550**	**1,940**	**390**	**25%**
	1.	Forested Landscape	0	0	0	0%
	2.	Non-Farm Fertilizer (Settlement Soils)	1,550	1,940	390	25%
	3.	Wildfires***	26	26	0	0%
	4.	Range Improvement***	0	0	0	0%
	5.	Prescribed Burn***	0	0	0	0%
	6.	Hazard Reduction Burn***	0	0	0	0%
I.	**Other Sources**		****1,240**	****1,552**	**312**	**25%**
	1.	Composting	-54,747	-68,528	-13,781	25%
	2.	Resource Recovery	-25,141	-31,469	-6,328	25%
	3.	Urban Forests	-12,443	-15,575	-3,132	25%
	4.	Military Bases (Aircraft)***	242,489	212,499	-29,990	-12%
	5.	Nitrogen Deposition	1,240	1,552	312	25%

* *Does not include the subtraction of sequestering sectors*
** *Does not include the Electricity Production sector as noted previously*
*** *Included for completeness only, not included in further descriptions of the County's emissions.*
**** *Does not include sequestering sectors noted by a negative sign*

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APPENDIX B

GHG REDUCTION TECHNICAL APPENDIX

Appendix B: GHG Reduction Technical Appendix

This appendix outlines the assumptions, data sources, and performance criteria used to estimate the GHG emissions reduction potential for each measure identified in Chapter 3 and the State-level measures identified in Chapter 2. The quantification of GHG reductions was based primarily on calculation methods detailed in the California Air Pollution Control Officers Association's (CAPCOA) report, Quantifying Greenhouse Gas Mitigation Measures (August 2010). The calculations utilize results from the regional GHG emissions inventory, and assumptions made about the degree of implementation in the year 2020. Performance criteria and assumptions were reviewed by local jurisdiction staff and the Advisory Committee to ensure that assumptions were appropriate for the region and achievable within the implementation time frame identified in Chapter 4.

Table B-1: Technical Assumptions for GHG Reductions from Local Measures

Measure	Regional 2020 GHG Reduction (MT CO_2e)	Performance Criteria	Assumptions
Energy			
E-1: Energy Efficiency Outreach and Conservation	6,054	30% of households and 35% of non-residential building owners participate in an incentive program with an average energy savings of 5% per household and 7% per non-residential building	This measure assumes that 30% of households and 35% of non-residential buildings will participate in an incentive program with an average energy savings of 5% per household and 7% per non-residential building by 2020.
E-2: Energy Audit and Retrofit Program	12,524	25% of households and non-residential buildings audited. Assumes 40% of buildings audited will result in energy efficiency improvements that on average result in 20% energy savings.	This measure assumes that 25% of households and non-residential buildings will be audited by 2020 and that 40% of buildings audited will result in energy efficiency improvements that on average result in 20% energy savings. (Energy Savvy, 2010)
E-3: Income-Qualified	6,730	10% of low- and	This measure assumes that 10% of low- and

Measure	Regional 2020 GHG Reduction (MT CO_2e)	Performance Criteria	Assumptions
Energy Efficient Weatherization		middle-income residential units upgraded with an average energy savings of 35%	middle-income residential units will be upgraded with an average energy savings of 35% by 2020. (Oak Ridge National Laboratory, 2010).
E-4: On-Site Small-Scale Solar Energy	10,617	10% of households install solar PV systems (average of 6 kW per system) and 5% of households install solar water heaters by 2020. 1 non-residential solar PV installation (average of 6 kW per system) per 50 employees and 1 solar water heater installation per 100 employees	Assumes that 29,469 kW of residential solar and 4,951 kW of non-residential solar will be installed on existing buildings by 2020. Assumes 2,456 residential solar water heaters and 413 non-residential solar water heaters will be installed on existing buildings by 2020. Assumes 10% electric and 90% natural gas. Average expected solar water heater savings: 2,945 kWh/yr; 139 therms/yr. (Solar Energy Industries Association, 2010; California Solar Initiative)
E-5: Incentives for Exceeding Title 24 Building Standards	11,716	20% of new or remodeled residences and non-residential buildings exceed 2013 Title 24 energy efficiency standards by 20%	This measure assumes that 20% of new or remodeled residences and non-residential buildings will exceed 2013 Title 24 energy efficiency standards by 20% by 2020.
Transportation and Land Use			
TL-1: Infill and Mixed-Use Development	6,139	20% shift of net new growth to within a quarter mile of transit stops or existing developed areas	This measure assumes that 20% of net new growth occurring by 2020 will occur within a quarter mile of transit stops or existing developed areas. Activity reductions (VMT and trip reduction) were calculated using the Envision Tomorrow™ Trend Scenario for Kings County developed by Fregonese as part of the San Joaquin Valley APCD contract. Future growth was re-painted to reflect growth within a quarter mile of transit stops and more compact growth patterns within or near existing develop areas. Low

Measure	Regional 2020 GHG Reduction (MT CO_2e)	Performance Criteria	Assumptions
			density housing developments in the unincorporated areas were moved to the within or near existing developed areas. This resulted is approximately a 20% shift of net new growth. GHG emission reductions were computed using EMFAC2011. (Kittleson & Associates, Inc., 2013)
TL-2: Bicycle and Pedestrian Environment	15	0.2% increase in walking/bicycling trips in incorporated areas and 0.1% increase in walking/bicycling trips in unincorporated areas	This measure assumes that future new trips by walking or bicycle will increase by 0.2% in incorporated areas and 0.1% in unincorporated areas by 2020. These percentages have been used in South Central Coast to determine the quantity of the trip reduction benefits under the federal CMAQ Program. The added trips were taken as a percentage of total vehicle trips, providing a vehicle trip reduction of 0.013%. An average walk trip length of 0.5 miles and an average bicycle trip length of 3 miles were assumed, arriving at a daily VMT reduction of 50 miles. (Kittleson & Associates, Inc., 2013)
TL-3: Expand Transit Network	44	5% increase in ridership due to increased access and small service efficiency improvements	This measure assumes a 5% increase in ridership due to increased access and small service efficiency improvements. Current annual passenger miles and annual boardings were acquired from the National Transit Database to calculate average transit trip length. GHG emission reductions were computed using EMFAC2011. (Kittleson & Associates, Inc., 2013)
TL-4: Employer-Based TDM	10,121	2.83% reduction in vehicle trips resulting in a 3.17% reduction in employee commute VMT to large (100+) worksites. Assumes 45.6% of home-based work trips are driven by	This measure assumes that there will be a 2.83% reduction in vehicle trips resulting in a 3.17% reduction in employee commute VMT to large (100+) worksites by 2020. Assumes 45.6% of home-based work trips are driven by employees working at large worksites. Baseline employment totals and the proportion of employers subject to Rule 9410

Measure	Regional 2020 GHG Reduction (MT CO_2e)	Performance Criteria	Assumptions
		employees working at large worksites	were derived from data compiled by the California Employment Development Department (EDD). Trip Reduction Impacts for Mobility Management Strategies (TRIMMS) (Version 3.0) software was used to estimate the trip and VMT reduction benefits resulting from future TDM implementation strategies. Baseline parameters were based on the Fresno model with inputs modified to match Kings County. GHG emission reductions were computed using EMFAC2011. (Kittleson & Associates, Inc., 2013)
TL-5: Parking Supply Management	8,301	12% reduction in parking at major worksites (over 100 employees)	This measure assumes that available parking at major worksites will be reduced by 12% by 2020. (Kittleson & Associates, Inc., 2013)
TL-6: Electric Vehicle Readiness	12,494	5% electric vehicle penetration by 2020 based on implementation of comprehensive electric vehicle network	This measures assumes 5% electric vehicle penetration by 2020. This is based on estimates of market penetration by the CARB that were adjusted upward to account for policies supporting enhanced electric vehicle infrastructure. EMFAC2011 was used to evaluate the impact of increasing the proportion of electric vehicles in use. (Kittleson & Associates, Inc., 2013)
TL-7: Low Carbon/Alternative Fuel Vehicles	24,156	7.5% of medium-heavy and heavy-heavy duty vehicles belonging to private fleets will convert to CNG by 2020. Assumes 75% of medium-heavy-heavy and heavy-heavy duty vehicles belong to private fleets. 0.5% of light-duty passenger	This measure assumes that 7.5% of medium-heavy and heavy-heavy duty vehicles belonging to private fleets will convert to CNG by 2020. Assumes 75% of medium-heavy-heavy and heavy-heavy duty vehicles belong to private fleets. Assumes 0.5% of light-duty passenger vehicles will convert to CNG by 2020. EMFAC2011 was used to evaluate the impact of increasing the proportion of CNG vehicles in use.

Measure	Regional 2020 GHG Reduction (MT CO_2e)	Performance Criteria	Assumptions
		vehicles will convert to CNG by 2020	(Kittleson & Associates, Inc., 2013)
TL-8: Traffic Flow and Light-Duty Passenger Vehicle Idling	4,818	Implementation of traffic flow improvements currently programmed under KCAG RTP	This measures assumes implementation of traffic flow improvements currently programmed under KCAG RTP by 2020. Forecast VMT by speed category was acquired from the KCAG Travel Demand Model. GHG reduction factors were acquired from Quantifying Greenhouse Gas Mitigation Measures published by the California Air Pollution Control Officers Association (CAPCOA). (Kittleson & Associates, Inc., 2013)
Solid Waste			
S-1: Solid Waste Reduction and Recycling	663	Increase solid waste diversion to 60% by 2020	This measure assumes an increase in solid waste diversion to 60% by 2020.
Trees and Other Vegetation			
T-1: Trees, Parks, and Open Space	16	Plant 1 tree for every 500 residents and employees (Approximately 442 total trees by 2020).	This measure assumes that 1 tree will be planted for every 500 residents and employees. This would result in approximately 442 total trees by 2020.
Community Education and Outreach			
C-1: Community Education and Outreach	Supporting Measure	Establish a CAP public outreach program	Supporting measure. Contributes to the GHG reduction potentials of other CAP measures.

Table B-2: Technical Assumptions for GHG Reductions from State Measures

Measure	2020 GHG Reduction (MT CO_2e)	Assumptions
Advanced Clean Cars	7.431	CARB anticipates that by 2020, Advanced Clean Cars will reduce CO_2e emissions by 3% and by 2025, CO_2e emissions would be reduced approximately 12% from 2008 baseline levels. The reduction increases to a 27% reduction from 2008 baseline levels in 2035 and even further to a 33% reduction in 2050. Reductions in GHG emissions from the Advanced Clean Cars program were calculated by taking 3% reduction from 2008 baseline transportation emissions from light-duty vehicles in 2020.
Title 24	17,127	The California Energy Commission (CEC) estimates that the 2008 standards reduce consumption by 10% for residential buildings and 5% for commercial buildings, relative to the previous standards. For projects implemented after January 1, 2014, the CEC estimates that the 2013 Title 24 energy efficiency standards will reduce consumption by 25% for residential buildings and 30% for commercial buildings, relative to the 2008 standards. These percentage savings relate to heating, cooling, lighting, and water heating only and do not include other appliances, outdoor lighting that is not attached to buildings, plug loads, or other energy uses. Therefore, these percentage savings were applied to the percentage of energy use covered by Title 24. The calculations and 2020 GHG emissions forecast assume that all growth in the residential and commercial/industrial sectors is from new construction. (CEC, 2008; Statewide Energy Efficiency Collaborative [SEEC], 2011)
Renewable Portfolio Standard	162,284	PG&E and SCE must have a renewable portfolio of 33% by 2020. In order to calculate future emissions that take into account the Renewable Portfolio Standard, 2020 PG&E and SCE emissions factors were applied to projected electricity usage. PG&E and SCE emissions factors were retrieved from the SEEC report, Greenhouse Gas Forecasting Assistant (October 2011).

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APPENDIX C

COST AND SAVINGS ANALYSIS

Appendix C: Cost and Savings Analysis

This appendix details the methodology, sources, and assumptions for the cost and savings estimates included in the CAP. Estimates are based on market research and represent the best available information at the time this CAP was developed. Costs associated with each measure are presented as the aggregated total for the measure, and are also broken out by the type of cost (i.e., capital cost, staff time, etc.) and how often it would occur (i.e., one time or annually). Costs account for the expense that would occur beyond the cost of conducting business-as-usual (i.e., without implementation of the CAP). Savings are general presented as the amount that would occur annually upon completion of the measure. For each measure, potential costs and savings to the local agencies and community (private costs/savings) are categorized as none, low, medium, and high. These categories correspond to a range, as shown in **Table C-1** below, as exact cost estimates are not known with any level of precision because the level of implementation for each action presented will vary widely throughout the region and will be dependent on availability of funding.

Table C-1: Measure Costs and Savings

Aggregated Local Agency Cost/Savings		Per-Unit Annual Public Cost/Savings	
None:	$0	None:	$0
Low:	$1 - $25,000	Low:	$1 - $2,500
Medium:	$25,001 - $50,000	Medium:	$2,501 - $5,000
High:	$50,001 or greater	High:	$5,001 or greater

APPENDIX C: COST AND SAVINGS ANALYSIS

Table C-2: Measure Costs and Savings Analysis

Measure	Local Agency Cost	Local Agency Savings	Local Agency Cost/Savings Discussion*	Public Cost	Public Savings	Public Cost/Savings Discussion
Energy Measures						
E-1: Energy Efficiency Outreach and Conservation	Medium	None	**Cost:** Annual costs are associated with staff time needed to collaborate with local energy suppliers and community organizations, conduct outreach and promotional activities, and track rebate and incentive programs (approximately 50-90 hours annually, or $3,750-$6,750 per year). Over the life of the plan (seven years), total costs would equal approximately $26,250-$47,250. Program costs would be borne by existing programs through federal and state agencies. **Savings:** None.	None	Varies	**Cost:** No mandatory costs, as this is a voluntary measure. For participating residents and businesses, costs will vary based on the degree of implementation and available rebates and other financial incentives. The incremental cost of replacing older, less efficient appliances and technologies with an ENERGY STAR product is as follows: computer $0, printer $0, refrigerator $30, vending machine $0, water cooler $0, dish washer $0, clothes washer $150, light bulb $2, exit sign $39, water heater $910, boiler $0.36/sq ft, chiller $0.36/sq ft. **Savings:** Savings results from reduced energy costs associated with reduced energy use due to conservation and efficiency upgrades. Savings vary based on degree of implementation and energy usage. The average annual savings of installing energy efficient appliances and technologies is as follows: computer $36, printer $30, refrigerator $30, vending machine $275, water cooler $34, dish washer $30, clothes washer $90, light bulb $13, exit sign $119, water heater $249,

Measure	Local Agency Cost	Local Agency Savings	Local Agency Cost/Savings Discussion*	Public Cost	Public Savings	Public Cost/Savings Discussion
						boiler $0.01/sq ft, chiller $0.14/sq ft. The average annual savings for the residential retrofit example is $200-$300, or $0.10 - $0.15/sq ft and $5,000 - $15,000, or $0.50 - $1.50/sq ft for the commercial example (ENERGY STAR, 2012; Yolo County, 2011; CEC, 2013).
E-2: Energy Audit and Retrofit Program	Low to Medium	Varies	**Cost:** Annual costs are associated with staff time needed to collaborate with local energy suppliers and community organizations to promote audit and retrofit programs (approximately 40-80 hours annually, or $3,000-$6,000 per year). Over the life of the plan (seven years), total costs would equal approximately $21,000-$42,000. Program costs would be borne by existing programs through federal and state agencies. **Savings:** Savings results from reduced energy costs associated with reduced energy use due to conservation and efficiency upgrades. Savings vary based on degree of implementation and energy usage.	None	Varies	**Cost:** No mandatory costs, as this is a voluntary measure. For participating residents and businesses, costs will vary based on the degree of implementation, available rebates and other financial incentives. In regards to retrofits, costs will vary based on the size, age, condition, and design of the building and site. For a representative 2,000 sq ft house, the initial capital cost of implementing basic, cost-effective energy conservation measures, which achieve an average of 15% energy efficiency improvement, would be $1,000 - $1,500, or $0.50-$0.75/sq ft. These improvements include attic and duct insulation, high efficiency heating system, low-flow plumbing fixtures, and high efficiency lighting. For a 10,000 sq ft commercial building, the initial cost of implementing basic cost-effective energy efficiency measures to achieve ~20% energy efficiency improvements would be

Measure	Local Agency Cost	Local Agency Savings	Local Agency Cost/Savings Discussion*	Public Cost	Public Savings	Public Cost/Savings Discussion
						$40,000-$100,000, or $4-$10/sq ft. These measures include: high efficiency heating and cooling system, variable frequency drives, high efficiency lighting systems, lighting controls, low flow fixtures, and high efficiency hot water boiler. The owner could leverage additional rebate/financing options to offset some costs. Energy Upgrade California offers rebates ranging from $2,000-$4,000. **Savings:** Savings varies based on total reduction in energy usage.
E-3: Income-Qualified Energy Efficient Weatherization	Low to Medium	None	**Cost:** Annual costs are associated with staff time needed to collaborate with community organizations to promote income-qualified weatherization programs (approximately 40-60 hours annually, or $3,000-$4,500 per year). Over the life of the plan (seven years), total costs would equal approximately $21,000-$31,500. Program costs would be borne by existing programs through federal and state agencies. **Savings:** None.	None	Low	**Cost:** Weatherization programs are provided at no cost to low- and middle-income households. **Savings:** The first-year energy savings for households is approximately 34.5% or $437 (ORNL, 2010). The average energy savings per low-income housing unit for Weatherization Assistance is estimated by the State of California Department of Community Services and Development (CSD) to be $400 per year (CSD, 2013).
E-4: On-Site Small-Scale Solar Energy	Medium to High	Low	**Cost:** This measure would have one time costs associated with staff time needed to improve the solar permit review and approval process (approximately 40 hours, or $3,000). Annual costs are associated with	None	Varies	**Cost:** No mandatory costs, as this is a voluntary measure. The average cost of solar photovoltaic installation per kW without subsidies or financial assistance is $10,000. The average cost of a solar hot

Measure	Local Agency Cost	Local Agency Savings	Local Agency Cost/Savings Discussion*	Public Cost	Public Savings	Public Cost/Savings Discussion
			staff time needed to work with the building industry, identify funding, and promote solar rebate and incentive programs (approximately 60-100 hours annually, or $3,000-$10,000 per year). Over the life of the plan (seven years), total costs would equal approximately $34,500-$55,500. Capital costs vary based on participation as well as rebates and incentives received for municipal solar installations. **Savings:** Savings varies based on total reduction in energy usage. The average annual savings is $965 for a 3 kW solar photovoltaic system and $1,138 for a 10 kW system			water heater is $3,000-$5,000. The California Solar Initiative Program offers cash rebates for solar water heating systems and for solar installations on your home or business. The federal government also offers tax rebates for solar installations. **Savings:** The average annual savings is $965 for a 3 kW solar photovoltaic system and $1,138 for a 10 kW system. The average annual savings is $250 for a solar hot water heater installed in a single-family home (California Solar Initiative, 2012).
E-5: Incentives for Exceeding Title 24 Building Standards	Low to Medium	None	**Cost:** Annual costs are associated with staff time needed to provide green building resources, project recognition, and outreach (approximately 40-80 hours annually, or $3,000-$6,000 per year). Over the life of the plan (seven years), total costs would equal approximately $21,000-$42,000. **Savings:** None.	None	Varies	**Cost:** No mandatory costs, as this is a voluntary measure. For participating builders energy efficient homes cost $0.91 - $1.25 per square foot more to build than current costs for traditional construction (Gabel Associates LLC., 2010). Costs vary based on type of building, size, location, and technology/building design. **Savings:** Savings varies based on reduced energy costs.
Transportation and Land Use Measures						
TL-1: Infill and Mixed-Use	Low	None	**Cost:** The majority of the activities occurring under this measure would be costs	None	Varies	**Cost:** None beyond cost of doing business-as-usual.

Measure	Local Agency Cost	Local Agency Savings	Local Agency Cost/Savings Discussion*	Public Cost	Public Savings	Public Cost/Savings Discussion
Development			associated with business-as-usual operation. This measure would have one time costs associated with prioritizing infill development (approximately 40 hours, or $3,000). Annual costs are associated with staff time needed to work with KCAG on updates to the Kings County Blueprint, and support/showcase smart growth projects (approximately 20-25 hours annually, or $1,500-$1,875 per year). Over the life of the plan (seven years), total costs would equal approximately $13,500-$16,125. **Savings:** None.			**Savings:** The savings for project applicants would vary based on incentives provided, ranging from low to high. Reductions in per capita vehicle travel would reduce direct and indirect transportation costs. Private savings would range from low to high depending on the individual reduction in VMT.
TL-2: Bicycle and Pedestrian Environment	Low	None	**Cost:** The majority of the activities occurring under this measure would be costs associated with business-as-usual operation. This measure would have one time costs associated establishing minimum design criteria (approximately 40 hours, or $3,000). Annual costs are associated with staff time needed to identify funding and collaborate with community organizations to support and expand bicycle and pedestrian network projects (approximately 20-40 hours annually, or $1,500-$3,000 per year). Over the life of the plan (seven years), total costs would equal approximately $10,500-$21,000.	None	Varies	**Cost:** No mandatory costs, as this is a voluntary measure. For participating builders, costs would vary based on the type of bicycle and pedestrian facilities provided. **Savings:** Switching from single-occupant vehicle to walking or biking reduces fuel and vehicle costs. The cost to own and operate a medium-sized car is approximately $9,122 per year, or $0.61 per mile (AAA, 2013). Private savings would range from low to high depending on the individual reduction in VMT.

Measure	Local Agency Cost	Local Agency Savings	Local Agency Cost/Savings Discussion*	Public Cost	Public Savings	Public Cost/Savings Discussion
			Savings: None.			
TL-3: Expand Transit Network	Low	None	**Cost:** Annual costs are associated with staff time needed to coordinate with KART and KCAG, and provide outreach (approximately 30-60 hours annually, or $2,250-$4,500 per year). Over the life of the plan (seven years), total costs would equal approximately $15,750-$31,500. **Savings:** None.	None	Varies	**Cost:** No mandatory costs, as this is a voluntary measure. For participating builders, costs would vary based on the type of safe route to transit facilities provided. **Savings:** This measure would encourage people to utilize public transportation and would reduce VMT and associated fuel and vehicle costs to community members. The cost to own and operate a medium-sized car is approximately $9,122 per year, or $0.61 per mile (AAA, 2013). Private savings would range from low to high depending on the individual reduction in VMT.
TL-4: Employer-Based TDM	Low to Medium	None	**Cost:** Annual costs are associated with staff time needed to coordinate with KART and KCAG to promote commute trip reduction programs (approximately 20-40 hours annually, or $1,500-$3,000 per year). Over the life of the plan (seven years), total costs would equal approximately $10,500-$21,000. **Savings:** None.	None	Varies	**Cost:** None. **Savings:** This measure would encourage people to commute via modes other than single occupancy automobiles. This would reduce fuel and vehicle costs for community members. The average cost to own and operate a sedan is approximately $9,122 per year, or $0.61 per mile. Private savings would range from low to high depending on the individual reduction in VMT (AAA, 2013).
TL-5: Parking Supply	Low	None	**Cost:** This measure would have one time	None	Varies	**Cost:** None.

APPENDIX C: COST AND SAVINGS ANALYSIS

Measure	Local Agency Cost	Local Agency Savings	Local Agency Cost/Savings Discussion*	Public Cost	Public Savings	Public Cost/Savings Discussion
Management			costs associated with staff time needed to assess/reduce existing parking requirements (approximately 20-40 hours, or $1,500-$3,000). **Savings:** None.			**Savings:** Savings varies based on switch from single-occupancy vehicle to alternative modes of transportation.
TL-6: Electric Vehicle Readiness	Medium	None	**Cost:** Annual costs are associated with staff time needed to coordinate with electric utility, develop and implement electric vehicle charging infrastructure plan, and conduct outreach (approximately 60-80 hours annually, or $4,500-$6,000 per year). Over the life of the plan (seven years), total costs would equal approximately $31,500-$42,000. **Savings:** None.	None	Varies	**Cost:** No mandatory costs, as this is a voluntary measure or part of doing business-as-usual. For informational purposes, home charging stations cost an average of $2,000. The cost of public electric vehicle charging station installation ranges from $10,000 to $23,000. Private costs may also voluntarily result from purchase of low carbon and alternatively fueled vehicles. On average the difference in purchase price for hybrid above similar non-hybrid vehicle: $4,315 (U.S. Department of Energy, 2013). **Savings:** Savings associated with electric vehicle use include savings from reduced fuel consumption. Private savings would range from low to medium depending on the individual reduction in fuel purchases. On average the difference in energy cost per mile between gasoline vehicles and hybrid vehicles is $0.0778/mile (Nissan, 2013; City of Boulder, 2013; Google.org, 2007).

Measure	Local Agency Cost	Local Agency Savings	Local Agency Cost/Savings Discussion*	Public Cost	Public Savings	Public Cost/Savings Discussion
TL-7: Low Carbon/Alternative Fuel Vehicles	Low to Medium	Low	**Cost:** This measure would have one time costs associated with staff time needed to develop a low-emissions vehicle replacement/purchasing policy (approximately 20 hours, or $1,500). Annual costs are associated with staff time needed to provide fueling station assistance and conduct outreach (approximately 20-40 hours annually, or $1,500-$3,000 per year). Over the life of the plan (seven years), total costs would equal approximately $12,000-$22,500. **Savings:** Savings varies based on total reduction in fuel usage. Difference in energy cost per mile between gasoline vehicle and hybrid: $0.0778/mile (Google.org, 2007).	None	Varies	**Cost:** No mandatory costs, as this is a voluntary measure or part of doing business-as-usual. For informational purposes, the cost of a compressed natural gas fueling station depends on the size, capacity, and type of compressed natural gas it dispenses. Average costs to install a natural gas charging station range from $10,000 to $2 million. **Savings:** Savings would range from low to medium depending on the differences in fuel prices and total fuel consumption. On average CNG is $1 per gallon cheaper than gasoline (Southern California Gas Company, 2013).
TL-8: Traffic Flow and Light-Duty Passenger Vehicle Idling	None	None	**Cost:** Costs associated with implementing programmed RTP traffic flow improvements are costs associated with doing business-as-usual. **Savings:** None.	None	Varies	**Cost:** None. **Savings:** Traffic signal synchronization and other traffic flow improvements result in reduced travel time and fuel consumption, which can result in monetary savings.
Solid Waste Measure						
Measure S-1: Solid Waste Reduction and Recycling	Low	None	**Cost:** This measure would have one time costs associated with staff time needed to provide recycling receptacles and develop a municipal policy (approximately 40 hours, or	None	None	**Cost:** None. **Savings:** None.

Measure	Local Agency Cost	Local Agency Savings	Local Agency Cost/Savings Discussion*	Public Cost	Public Savings	Public Cost/Savings Discussion
			$3,000). Annual costs are associated with staff time needed to coordinate with waste hauler (approximately 20-40 hours annually, or $1,500-$3,000 per year). Over the life of the plan (seven years), total costs would equal approximately $13,500-$24,000. **Savings:** None.			
Trees and Other Vegetation Measure						
T-1: Trees, Parks, and Open Space	Low	None	**Cost:** This measure would require City staff time to develop tree planting guidelines (approximately 40 hours, or $3,000 in onetime costs). All other costs are costs associated with business-as-usual. **Savings:** None.	None	Varies	**Cost:** No mandatory costs, as this is a voluntary measure. However, for informational purposes, initial costs for planting, staking, and mulching are estimated at $100–$300 per tree depending on the size and tree type. Yearly maintenance costs are estimated at $15 to $65 per tree, depending on the maturity and type of tree (City of Stockton, 2012). **Savings:** Indirect savings would depend on the number of trees planted to shade buildings, with net annual benefits ranging from approximately $30-$90 per shade tree (City of Stockton, 2012).
Community Education and Outreach Measure						
C-1: Community Education and Outreach	Medium to High	None	**Cost:** This measure would result in annual costs associated with staff time to conduct public education and outreach associated with the CAP and CAP measures	None	None	**Cost:** None. **Savings:** This measure would not result in direct savings to community members, but may result in indirect savings due to

Measure	Local Agency Cost	Local Agency Savings	Local Agency Cost/Savings Discussion*	Public Cost	Public Savings	Public Cost/Savings Discussion
			(approximately 80-100 hours annually, or $6,000-$7,500 per year). Over the life of the plan (seven years), total costs would equal approximately 42,000-$52,500.). **Savings:** None.			actions taken based on education and outreach efforts.

*Local agency costs are calculated based on a rate of $75 per hour.

APPENDIX D

EXISTING AND/OR COMPLETED GHG REDUCTION MEASURES FOR AVENAL AND HANFORD

Appendix D: Existing and/or Completed GHG Reduction Measures for Avenal and Hanford

The participating jurisdictions, the cities of Avenal and Hanford, have implemented, adopted, and/or programmed a number of local measures since the 2005 baseline inventory year that will support the GHG reduction measures and implementation actions listed in Chapter 3 and help to reduce the region's GHG emissions. A brief description of each of these local measures is provided below for each participating jurisdiction by topic area corresponding to the GHG reduction measures in Chapter 3.

Avenal Existing Measures

Energy Measures

Energy Efficiency Retrofits and Upgrades

- In 2010, the City received a PG&E Grant to conduct energy efficiency retrofits of City Hall and the Corporation Yard.
- In 2010, the City replaced 24 streetlights in the downtown.
- The City has retrofitted all facility lighting from T-12 to T-8 or T-5. Upgraded facilities include City Hall, Corporation Yard, Veterans-Senior Center, Water Plants one and two and the waste water treatement plant.
- The City has installed LED exit lights in the Corporation yard, wastewater and water treatment plant facilites.
- The City's Tank 4 In-Conduit Hydroelectric Project replaced the City's water storage Tank 4 with an in-conduit turbine system which captures some of the energy of the gravitational flow within the drinking water system to generate electricity.

Energy Efficiency Outreach and Incentives

- Reduce energy use in residential developments by providing information and low-energy products to residents (Kings County Housing Element Objective 1.18 Energy Conservation).

On-Site Small-Scale Solar Energy

- In 2010, the City installed solar lighted crosswalks.
- Require area and stationary source projects that generate significant amounts of air pollutants to incorporate air quality mitigation in their design, including: the promotion of energy efficient designs, including provisions for solar access, building siting to maximize natural heating and cooling, and landscaping to aid passive cooling and to protect from winter winds (General Plan AQ Policy 2).

Transportation Measures

Smart Growth

- The City offers density bonuses and incentives for high-density, infill, and/or transit oriented development.
- First priority shall be given to development of vacant, underdeveloped, and/or re-developable land where urban services are or can be made available (General Plan Urban Boundary Element, 10.1 Urban Boundaries Policy 1).
- Give priority consideration to infill development of vacant and underutilized land within the City limits. Consideration shall be given by financially assisting such development through special infrastructure financing programs, if available (General Plan Land Use Element, 7.2 Residential Policy 1).
- Facilitate infill development by providing the location and zoning of residential infill sites in the community and working with developers to expedite applications (Kings County Housing Element Objective 1.5 Infill Development).
- Encourage land use development to be located and designed to conserve air quality and minimize direct and indirect emissions of air contaminants by doing the following: Accommodate a portion of the projected population and economic growth of the City in areas having the potential for revitalization, Encourage a development pattern that is contiguous with existing developed areas of the City, Consider the jobs/housing/balance relationship (i.e., the proximity of industrial and commercial uses to major residential areas) when making land use decisions, Encourage small neighborhood-serving commercial uses within or adjacent to residential neighborhoods when such areas are aesthetically compatible with adjacent areas; do not create conflicts with neighborhoods schools; minimize traffic, noise, and lighting impacts; encourage and accommodate pedestrian and bicycle access; and are occupied by commercial uses that have a neighborhood-scale market area rather than a community-wide market area, Locate public facilities (libraries, parks, schools, community centers, etc.) with consideration of transit and other transportation opportunities (Air Quality Element, Policy 5).
- Encourage growth patterns that will promote livable neighborhood development principles including the following: Providing compact development so that vehicle use is reduced to the extent practicable, and so that vehicle trips are shorter, Neighborhoods should be designed as suburban "villages" with connectivity consistent with the circulation element's policies, City neighborhoods (one square mile area) should have a mix of land uses including housing, schools, small shops and neighborhood shopping centers, Residential uses should be clustered within walking distance of commercial and service facilities (General Plan Community Design Element 8.2 Residential Development Policy 4).
- Plan and coordinate residential development in close proximity to planned urban facilities and services such as schools, parks, sanitary sewer, water, storm drainage, circulation network, transportation facilities and commercial centers (General Plan Land Use Element, 7.2 Residential Policy 6).
- Encourage higher density residential development near employment centers, commercial development and parks (General Plan Land Use Element, 7.2 Residential Policy 14).
- Commercial areas are encouraged to cluster in identified areas such as the downtown area to prevent and discourage strip development. Where appropriate, locate commercial uses at focal points along major arterial streets such as Skyline Boulevard (General Plan Economic Development Element, 4.1 Adequate Industrial, Commercial and Office Policy 4).

Avenal Existing Measures

• Locate High Density Residential development (up to 58 persons per acre - 15 to 29 dwelling units per net acre) throughout the City at arterial and Collector locations (General Plan Land Use Element, 7.2 Residential Policy 20).

Bicycle & Pedestrian Network

• In 2010, the City installed solar lighted crosswalks as part of their Safe Routes to School network.

• Design the street network with multiple connections and relatively direct routes for motorists, as well as pedestrians and bicyclists (General Plan Circulation 6.1 General Circulation and Street System Policy 14).

• In existing developed areas where sidewalks do not exist, the City shall continue to support existing programs and pursue new programs for sidewalk construction. Bicycle accidents shall continue to be monitored and bicycle paths and lanes shall be established upon need (General Plan Circulation 6.3 Pedestrian and Bicycle Modes Policy 1).

• Locate sidewalks, pedestrian paths, and appropriate crosswalks to facilitate access to all schools and other areas with significant pedestrian traffic. Whenever feasible, pedestrian paths shall be developed to allow for unobstructed pedestrian flow from within a neighborhood (General Plan Circulation 6.3 Pedestrian and Bicycle Modes Policy 7).

• Partially or wholly close certain streets which are not required for traffic so that they can be used for pedestrian circulation and open space use (General Plan Circulation 6.3 Pedestrian and Bicycle Modes Policy 4).

• Residential streets shall be designed with sidewalks on both sides. Sidewalks shall be a minimum width of 4.5 feet to provide enough room for two pedestrians to walk side by side. Sidewalks and bike lanes shall be shaded by trees for pedestrian comfort (General Plan Circulation 6.1 General Circulation and Street System Policy 15).

• Widen sidewalks above the minimum established Improvement Standards where intensive commercial, recreation or institutional activity is present and where residential densities are high (General Plan Circulation 6.3 Pedestrian and Bicycle Modes Policy 3).

• Ensure convenient and safe pedestrian crossings (General Plan Circulation 6.3 Pedestrian and Bicycle Modes Policy 5).

• Pedestrian and bicycle access shall be provided on Local streets and Minor Collectors to enable pedestrians to have access through a neighborhood, to shopping areas, to transit stops, schools and other such facilities (General Plan Circulation 6.3 Pedestrian and Bicycle Modes Policy 6).

• Restrict truck traffic along Kings Street in order to facilitate and encourage pedestrian access to downtown during prime business hours (GP Circulation 6.1 General Circulation and Street System Policy 6).

• Require that Collector streets which are identified to function as links for the bicycle transportation system be provided with Class II bikeways (bike lanes) or show an alternative route. Arterial streets shall provide for a Class II bike route. In such cases, the City shall accommodate cyclists on these identified streets by widening the street or eliminating on-street parking wherever possible (General Plan Circulation 6.3 Pedestrian and Bicycle Modes Policy 10).

• Incorporate features such as bus shelters, bicycle storage, bicycle racks and park and ride lots into the design of public and private development projects (General Plan Circulation 6.1 General Circulation and Street System Policy 2).

• Require bicycle storage facilities as a condition of approval for multi-family residential development projects containing 10 or more units and for all commercial and public development proposals (General Plan Circulation 6.1 General Circulation and Street System Policy 4).

• Encourage the inclusion of green belts and common open space for pedestrian use within the residential development areas (General Plan Circulation 6.3 Pedestrian and Bicycle Modes Policy 9).

• Encourage adequate and secure bicycle storage facilities at all governmental, commercial and parks locations throughout the City (General Plan Circulation 6.3 Pedestrian and Bicycle Modes Policy 15).

• Designate a network of bicycle routes providing safe passage throughout the City; establish linkages between schools, parks and designated bikeways (General Plan Circulation 6.1 General Circulation and Street System Policy 3).

• Emphasize pedestrian amenities in the downtown area, including landscaped open space areas, street furniture, lighting and signage (General Plan Land Use Element, 7.1 Community Policy 3).

• In order to encourage the integration of Neighborhood and Community Commercial uses into neighborhoods, designs should de-emphasize the usage of walls as buffers where they create barriers to pedestrian access. Continuous block walls shall be discouraged and offsets, landscaping pockets and openings shall be encouraged (General Plan Land Use Element, 7.3 Commercial Policy 5).

• Require the provision for safe bicycle circulation in all new developments, including bicycle parking facilities and internal bicycle and pedestrian routes (General Plan Circulation 6.3 Pedestrian and Bicycle Modes Policy 12).

Expand Transit Network

• Coordinate the City's dial-a-ride system with regional transit services (General Plan Circulations 6.4 Transit Policy 3).

Avenal Existing Measures

• Develop strategies to minimize the number and length of vehicle trips, which may include: Encouraging the provision of transit, especially for employment-intensive uses of 200 or more employees, Providing expansion and improvement of public transportation services and facilities in conjunction with KART (General Plan Air Quality Element Policy 3).

• Give a high priority to public transportation systems which are responsive to the needs of the commuter, aged, handicapped and disadvantaged (GP Circulations 6.4 Transit Policy 5).

Employer-Based TDM Program

• Develop strategies to minimize the number and length of vehicle trips, which may include: Promoting commercial/industrial project proponent sponsorship of van pools, Encouraging the provision of transit, especially for employment-intensive uses of 200 or more employees (General Plan Air Quality Element Policy 3).

Parking Supply Management

• The City's Municipal Code, Chapter 9-60.07 allows the joint use of parking facilities by church or auditorium and a daytime use (e.g., banks, business offices' retail stores, personal service shops, clothing or shoe repair or service shops, manufacturing, wholesale buildings).

• Conduct an assessment of existing parking requirements and consider reducing them as a means of attracting commercial development (General Plan Circulation 6.1 General Circulation and Street System Policy 5).

Electric Vehicle Readiness and Low-Carbon/Alternative Fuel Vehicles

• Require area and stationary source projects that generate significant amounts of air pollutants to incorporate air quality mitigation in their design, including: the use of new and replacement fuel storage tanks at refueling stations that are clean fuel compatible, if technically and economically feasible (General Plan Air Quality Element, Policy 2).

• Coordinate with other local and regional jurisdictions, including the SJVAPCD and the California Air Resources Board (ARB), in the development of regional and county clean air plans and incorporate the relevant provisions of those plans into City planning and project review procedures. Also cooperate with the SJVAPCD and ARB in: Economy clean fuel for city vehicle fleets, when feasible (General Plan AQ Policy 1).

• The City received a grant from the SJVAPCD to purchase a plug-in hybrid car for use by City Staff and an electric cart used by the landscaping crews.

Solid Waste Measures

Solid Waste Reduction and Recycling

• The City's Municipal Code Section 6-2.11.5 requires all persons within the city owning or in control of an occupied building to subscribe to mandatory recycling collection services.

• The City currently implements a residential and/or commercial curbside recycling program with Mid Valley Disposal.

• The City offers special waste programs to recover bulky items from mixed landfill garbage (e.g., asphalt and concrete, tires, white goods).

• The City provides greenwaste pick-up and composting.

• The City's Municipal Code Section 8-9.03 requires that at least 50 percent of waste material of construction and demolition debris generated from low-rise residential and non-residential construction be diverted from disposal. It also allows reverse recycling vending machines as an accessory commercial use.

Urban Greening Measures

Trees, Parks, and Open Space

• The City has developed a list of native, drought- tolerant tree species which are appropriate to plant in the City.

• In 2011, the City planted 30 trees at City Sports Complex.

• In 2012, the City planted 68 trees at City Sports Complex using a Cal Fire Grant.

• The City's General Plan Land Use Element includes a policy to develop a citywide street tree and landscape master plan to delineate neighborhoods, master and specific plan areas.

• Section 8-7.05 of the City's Municipal Code requires residential development to include two to three shade trees in zoning districts RRE and R and one shade tree for every two parking spaces in parking lots in the RM, PO, T, CC, CS, CH, CN, and IG zones. Industrial zones are required to plant trees in 20 foot intervals.

• Section 8-7.07 of the City's Municipal Code requires fifty percent of paved parking lots to be shaded by tree canopy within 15 years of planting.

• Section 9.60.08G requires all parking lots containing six or more spaces, to landscape at least five percent of the total parking area.

Hanford Existing Measures

Energy Measures

Energy Efficiency Outreach and Incentives

- The City participates in the San Joaquin Valley Clean Energy Organization's (SJVCEO) Valley Innovative Energy Watch (VIEW) Partnership. The VIEW partnership focuses efforts in three main areas of impact: reduction of energy in government facilities through municipal retrofits, increasing community awareness through education, marketing and outreach, and support of the California Long Term Energy Efficiency strategic plan. The SJVCEO conducts community education and outreach, marketing to municipal employees and the tracking of utility savings programs.
- Facilitate efforts that increase the public's understanding of the linkage between land use, transportation, water and energy use and air pollution. Efforts should include informing the public of measures that individuals can take and resources that are available to improve air quality and reduce potential climate change impacts (General Plan Policy AQ 2.1).
- Support the efforts of local public and private groups that provide air quality, public health, and climate change education and outreach programs (General Plan Policy AQ 2.2).
- Work with the Kings County Office of Education, local school districts, and the San Joaquin Valley Air Pollution Control District to provide information to students on air pollution, public health effects and climate change, and our collective responsibility for improving our quality of life (General Plan Policy AQ 2.3).
- The City will use its website and utility mailouts to inform the public about upcoming events promoting air quality, water conservation, recycling and tips for reducing emissions and saving water and energy, and opportunities for rebates and similar programs (General Plan Program AQ 1.2).
- Track conservation related grant and incentive programs and provide this information to public and private sector partners through the city's website, email distribution lists, and other outreach opportunities (General Plan Program AQ 7.2).

Energy Audit and Retrofit Program

- In 2010, the City accomplished energy saving improvements to the City Pool including new pool covers and a Variable Frequency Drive controller.
- In 2010, the City purchased an Energy Star ice maker and refrigerator. It is standard practice of the Public Works Department to install high efficiency equipment.
- In 2010, the City installed low-flow faucets and toilets at the City Corporation Yard and other facilities.
- In 2012, the City replaced 17 HVAC units at the City Hall and Longfield Recreation Center.
- The City performs annual pumping efficiency tests on its water suppliers.
- The Valley Innovative Energy Watch (VIEW) partnership has completed the upload and registry of City facilities with Automated Benchmarking Services.
- City staff will proactively work with the California Energy Commission, local water and energy utilities, industry, and other potential partners to seek funding sources and implement programs which reduce water and energy use, reduce air emissions and reduce the creation of greenhouse gases (General Plan Policy AQ 7.5).
- The City will assign staff to share ideas, coordinate and assist City Departments in identifying opportunities for reductions from activities under the Department's authority. Progress in implementing environmental and energy programs will be reported to the City Council on an annual basis (General Plan Program AQ 5.1).
- In 2010, the City coordinated with the Southern California Edison Power Company to offer the Direct Install Program, which contracts with highly-skilled energy efficiency experts to identify energy savings opportunities in businesses for free.
- Initiate and sustain ongoing efforts with local water and energy utilities and developers to establish and implement voluntary incentive based programs to encourage the use of energy efficient designs and equipment in new and existing development projects within the City (General Plan Policy AQ 7.2).
- The City has 48 signal controlled intersections, all of which utilize energy efficient LED signals as a means of providing a brighter light display as well as a cost savings on energy usage.
- In 2012, the City retrofitted approximately 320 decorative downtown street and parking lot lights with new induction lighting technology.
- One fixture in the double-fixture decorative street lights in the downtown turn off after midnight to conserve energy.
- The City has retrofitted all facility lighting from T-12 to T-8 or T-5. Upgraded facilities include City Hall, Police Departments including Record and Investigation, Corporation Yard, Veterans-Senior Center Coe Park, Longfield Recreation Center, Plunge, two wings of the Civic Auditorium, and Fire Stations 1 and 2.
- The City has installed LED exit lights in the Civic Auditorium, Police Department, City offices, Senior-Veterans Center, Intermodal, Corporation yard, and Longfield Recreation Center.

Hanford Existing Measures

• The City has installed motion sensors in the restrooms at the Corporation yard and the City offices, and light timers in the custodian closets at the Corporation yard, Police Department, Civic Auditorium and Senior-Veterans Center.

On-Site Small-Scale Solar Energy

• In 2010, the City adopted two ordinances amending Title 15 of the Hanford Municipal Code. Chapter 15.38 includes by reference the Uniform Solar Energy Code, 2009 Edition, published by the International Association of Plumbing and Mechanical Officials. Chapter

• The City participates in the Solar Roadmap program which has identified 7,382 solar viable residences, 37,650 kW of residential solar potential, and 100,306 kW of total solar market potential in the community.

• The City will work with the building industry to incorporate designs improving solar readiness into building plans through voluntary green building guidelines (GP Program AQ 7.3).

• Encourage the use of solar-ready roofs into residential and commercial development. New residential development should include proper solar orientation (south facing roof area sloped at 20° to 55° from the horizontal), clear access on the south sloped roof (no chimneys, heating vents, plumbing vents, etc.), electrical conduit installed for solar electric system wiring, plumbing installed for solar hot water systems, and space provided for a solar hot water storage tank. Roofs for commercial development should be designed to maximize potential area available for solar panels and provide electrical conduit to support future installation (General Plan Policy AQ 7.6).

• In 2011, the City completed a one-MW Solar Project with Chevron Energy Solutions at the Wastewater Treatment Plant.

• The City is currently exploring Phase II solar power feasibility.

Incentives for Exceeding Title 24 Building Standards

• The City's Municipal Code, Title 15, Chapter 15 adopts Title 24 of the California Building Code.

• Support and recognize developers proposing projects that comply with the state's Green Building Standards voluntary tier levels or other enhanced energy conservation and sustainable rating systems such as LEED certification, Greenpoint Rating, and Energy Star (General Plan Policy AQ 7.3).

• Require water conservation and energy efficiency techniques to be incorporated into the design of all development projects (General Plan Policy OCR 11.3).

• In addition to the energy regulations of Title 24, the energy efficiency of new development shall be promoted (General Plan Policy OCR 11.5).

• The City will provide project applicants with the San Joaquin Valley Air Pollution Control District's Best Performance Standards list for greenhouse gas reductions when available, and will work with applicants to incorporate design features that reduce emissions (General Plan Program AQ 4.2).

• The City shall encourage through education and/or incentives energy efficient development design. Possible energy efficient design techniques include: provisions for solar access; building siting to maximize natural heating and cooling; and landscaping to aid passive cooling and the protection from winter wind (GP Program OCR 11.5-A).

• Initiate and sustain ongoing efforts with local water and energy utilities and developers to establish and implement voluntary incentive based programs to encourage the use of energy efficient designs and equipment in new and existing development projects within the City (General Plan Policy AQ 7.2).

Transportation and Land Use Measures

Smart Growth

• Through project review, evaluation, and conditions of approval, minimize air quality and potential greenhouse gas impacts when planning the location and design of land uses and transportation systems needed to accommodate expected City population growth. Integrate decisions on land use and development locations with the San Joaquin Valley Blueprint (General Plan Policy AQ 3.1).

• Guide urban development toward vacant or under-used land within the urbanized area and direct new growth toward contiguous lands to protect agricultural lands and other open spaces used for the managed production of resources from premature urban development (General Plan Objective OCR-6).

• The City prefers contiguous urban development within the General Plan Area Boundary, however this may not always be feasible or possible given short-term ownership and development financial constraints. Leapfrog development greater than 1/2 mile from existing urban uses shall be discouraged (General Plan Policy LU 24.3).

• The City shall encourage Master Plans and Specific Plans that contain density bonus areas that are tied to open space or other public amenities (General Plan Program LU 3.2-A).

• Encourage the development of employment opportunities in Hanford to reduce the need to commute to other communities for employment (General Plan Policy CI 10.2).

Hanford Existing Measures

• Neighborhood Commercial sites shall provide neighborhood-oriented mixed uses that provide for convenience shopping and services (General Plan Policy LU 18.1).
• Mixed and higher intensity uses that support the overall intent of the Downtown Business District should be encouraged by the adoption of a flexible zoning district for the area (General Plan Policy LU 14.2).
• Amend the Zoning Ordinance to provide for a new Downtown Business District Classification which allows flexibility in the combination of uses including retail sales, restaurants, offices, entertainment, artisans, government offices, multi-family residential, and open space use consistent with an adopted Specific Plan (General Plan Program LU 14.2-A).
• The City will develop an air quality and climate change review checklist that can be provided to developers and staff to assist in identifying design measures and conditions of approval that can be incorporated into land use and transportation projects to reduce air quality and climate change impacts (General Plan Program AQ 3.2).
• The Hanford Municipal Code Title 17, Chapter 17.40 allows home occupations in urban and rural areas subject to conditions.

Bicycle & Pedestrian Network

• In 2010, the City updated their Bicycle Master Plan which includes an implementation program to improve and expand the city's bicycle network.
• In 2012, the City installed bicycle parking at the Kings Area Rural Transit Facility.
• The street maintenance division paints street centerlines, edge lines, bike lanes and pavement markings throughout the city once every two years.
• The Hanford Parks, Recreation and Open Space Master Plan includes an Action Plan which identifies strategies for developing additional bike lanes and trail connections within the community.
• Bicycle lanes should be established where feasible along Major and Minor Collectors in newly developing areas. A bicycle route system should be identified which serves the existing developed City. This route system may not utilize Arterials or Collectors where travel ways are constrained, but rather parallel streets with less traffic. Where bicycle lanes are proposed they should be considered a shared facility with vehicular traffic on the street (General Plan Policy CI 8.4).
• In 2010, the City completed streetscape along East Seventh Street in the Downtown.
• The City's Downtown Reinvestment Fund provides loans to businesses in the downtown area for infrastructure improvements such as sidewalks, street trees, and tree grates in the form of a grant up to $10,000.
• The street maintenance division installs approximately 30,000 square feet of sidewalk each year.
• The City installed lighted pedestrian crosswalks adjacent to Hanford High School.
• The Hanford Parks, Recreation and Open Space Master Plan includes an Action Plan which identifies strategies for providing additional pedestrian and trail connections within the community.
• Promote maximum opportunities for pedestrian traffic throughout the City by continuing to develop and maintain a safe sidewalk system that facilitates pedestrian access, including disabled persons accessibility to public transit for commuting, recreation or other purposes (General Plan Objective CI 8).
• Adequate sidewalks shall be planned and constructed in connection with street construction work in the City. Where existing roads may require additional right-of-way to accommodate full improvements including sidewalks, and where it is impractical to acquire sufficient right-of-way, the vehicle travel way will be the first priority (GP Program CI 8.1).
• Implement street standards that include sidewalk or walkways on both sides of streets, where appropriate (General Plan Program CI 8.2-A).
• Subdivision layouts should include safe and pleasant designs which promote pedestrian access to Arterial and Major collector streets, and consider the location of community services, such as schools, parks, and neighborhood shopping activity centers in the accessibility of their design for all persons (GP Policy CI 8.2).
• In order to promote pedestrian access, encourage land use designs in new development areas to locate neighborhood shopping and services within approximately 1/2 mile of major residential areas (GP Policy CI 8.6).
• Subdivision designs should be encouraged to use "daylighted" cul-de-sacs opening on to Arterial and Collector streets thereby providing enhanced pedestrian access to future public transit system routes (GP Program CI 7.2-A).

Expand Transit Network

• Support the expansion and improvement of transit systems and ride sharing programs to reduce the production of automobile emissions (General Plan Policy CI 10.3).
• Planning and development of Arterial and Major Collector Streets shall include design features, which can be used as public transit stops (General Plan Policy CI 7.2).

Hanford Existing Measures

- Where right-of-way allows, arterial and Major Collector streets shall be designed to allow transit vehicles to pull out of traffic by using either a continuous parking lane with bus stops, or with special bus pull-out lanes (General Plan Program CI 7.2-C).
- Work with the various government agencies to provide secure parking at park-and-ride lots and transit stations (General Plan Policy CI 3.6).
- Consult with the transit provider to determine if transit-supporting infrastructure such as bus stops, turnouts, transit kiosks, or similar items that encourage transit use are appropriate for the site for projects on current and proposed transit routes (General Plan Policy AQ 6.2).
- Include the Kings County Area Public Transit Agency in review of all development projects and consider environmental mitigation measures that will maintain and extend their current level of service to new development (General Plan Program CI 7.1-A).
- The Planning Department will review projects upon receipt of applications and initial consultation with applicants to identify appropriate transportation supportive infrastructure and end of trip facilities should be included in the project. The City consults with Kings Area Rapid Transit (KART) to identify end of trip facilities supportive of vanpools and transit service in shopping center projects (General Plan Program AQ 6.1).
- Integrate into the City Public Works Construction Standards design details for "daylighted" cul-de-sacs that can be jointly used for public transit pick-up locations along Arterial and Collector streets (General Plan Program CI 7.2-B).

Employer-Based TDM Program

- City staff assigned to Kings County Association of Governments transportation planning committees will identify programs and projects that improve transportation alternatives for City residents and businesses during funding cycles and when grant opportunities are available (General Plan Program AQ 6.1).
- Work proactively with King County Association of Governments, employers and developers to provide affordable transportation alternatives and telecommuting options to serve both new and existing land uses designated by the General Plan (General Plan Policy AQ 6.1).
- Adopt a Trip Reduction Ordinance (TRO) in accordance with District Air Quality and Congestion Management requirements (GP Program CI 6.2-A).
- Provide end of trip facilities such as preferential parking for vanpools and rideshare, bicycle parking, and other facilities suitable for the type of business for projects with the potential for over 100 employees to support compliance with San Joaquin Valley Air Pollution Control District Rule 9410 (General Plan Policy AQ 6.3).
- Provide off-street parking to employees; however preferential parking at several strategic locations in westside and eastside growth centers shall be made available to vanpools, carpools and other transit users (General Plan Policy CI 5.1).
- Continue to support Kings County Association of Governments ride-sharing programs which provide up-to-date lists of potential riders and education of the public on commuting options (General Plan Policy CI 3.7).
- Encourage the use of carpooling, vanpooling, and flexible employment hours to maintain an acceptable level of service on City streets and highway/intrastate facilities (General Plan Policy CI 6.1).
- Sites for park-and-ride lots should be encouraged to be incorporated in planned commercial parking areas (General Plan Policy CI 5.1-B).
- Sites for park-and-ride lots should generally be located near highly traveled commute routes such as the intersections of 12th Avenue and Highway 198, 10th Avenue and Highway 43, future major commercial areas at Grangeville Blvd. and Highway 43, Lacey Blvd. and Highway 43, and 13th Avenue and Highway 198 (General Plan Policy CI 5.1-A).
- In 2012, the City installed bicycle parking at the Kings Area Rapid Transit Facility.
- Implement feasible and affordable, innovative and flexible employer based trip reduction programs for City employees (General Plan Policy AQ 5.1).
- Support the development and use of teleconferencing facilities and web-based video conferencing by City agencies in lieu of travel to conferences and meetings (General Plan Policy AQ 5.2).

Parking Supply Management

- Encourage shared parking facilities for both private businesses and public agencies (General Plan Policy CI 5.2).

Electric Vehicle Readiness and Low-Carbon/Alternative Fuel Vehicles

- In 2012, KART constructed a new slow fuel CNG fueling station for KART buses in the City.
- The City will work with the San Joaquin Valley Air Pollution Control District, government fleet vehicle and equipment operators, and local businesses to identify vehicles and equipment eligible for participation in San Joaquin Valley Air Pollution Control District grant and incentive projects (General Plan Program AQ 4.3).

Hanford Existing Measures

• City fleet vehicle operators shall develop and maintain a fiscally sound inventory and priority schedule to replace or convert existing inefficient vehicles with higher efficiency conventional or clean fuel vehicles or hybrid vehicles that meet operational requirements as new vehicles are purchased and existing vehicles are retired from service (GP Policy AQ 5.3).

Traffic Flow and Light-Duty Passenger Vehicle Idling

• From 2006-2013, the City performed synchronization of 11th Avenue, 12th Avenue, and Lacey Boulevard.

• Reduce traffic congestion at key intersections throughout the City (General Plan Policy CI 2.3).

• Achieve a coordinated regional and local transportation system that minimizes traffic congestion and efficiently serves users (General Plan Objective CI 3).

• Transportation projects shall be prioritized with emphasis on reducing traffic congestion and improving traffic circulation (General Plan Policy CI 2.1).

• Develop Transportation Systems Management (TSM) programs for the Hanford area in order to reduce the amount of peak hour congestion on City streets (General Plan Objective CI 6).

• Implement TSM programs in conjunction with new development in the industrial park, and growth centers on the westside and eastside of the City (General Plan Policy CI 6.3).

• Properly space and coordinate traffic signals in order to minimize the acceleration, idling and deceleration that produces higher vehicular emissions levels as part of the Traffic System Management (TSM) implementation (GP Policy CI 10.4).

• Project sponsors shall demonstrate that all feasible Transportation Control Measures and other measures have been incorporated into project designs which increase the effective capacity of the existing road network prior to seeking approval to construct additional roadway capacity, such as additional lanes or new highways (GP Policy AQ 6.1).

• New development shall consider Transportation System Management and Transportation Demand Management as strategies for the mitigation of traffic and parking congestion. Public transit, traffic management, ridesharing and parking management are to be used to the greatest extent practical to implement transportation management strategies (General Plan Program CI 6.3-A).

• Street improvements shall be prioritized with emphasis on current and forecasted service levels. Roadways experiencing or forecasted to experience conditions less than Level-of-Service "D" shall require improvements, unless the City's design considerations or other public health, safety or welfare factors determine otherwise (General Plan Policy CI 2.2).

• Improve intersections operating at less than peak hour Level of Service "D" conditions by adding appropriate turning lanes to congested approaches, widening intersection approaches, or modifying signal timing at intersections and coordinating with other signals, as appropriate, unless the City's design considerations or other public health, safety, or welfare factors determine otherwise (General Plan Program CI 2.3-A.

• Design new development projects within the City that provide facilities and programs that improve the effectiveness of transportation control measures and congestion management programs such as bicycle paths and lanes, sidewalks and pedestrian paths, secure bicycle parking, transit stops at appropriate locations, transportation demand management programs at large employers, and transportation improvements that reduce congestion and improve traffic flow (General Plan Objective AQ 6).

Solid Waste Measures

Solid Waste Reduction and Recycling

• The City provides for the free disposal of e-waste, u-waste, and motor oil at the City corporation yard.

• The City currently implements a residential and/or commercial curbside recycling program.

• The City offers special waste programs to recover bulky items from mixed landfill garbage (e.g., asphalt and concrete, tires, white goods, pesticide containers, wood) through Kings County Waste Management Authority "Landfill Salvaging" program.

• The City encourages construction and demolition waste recycling, and provides public information directing such waste to the Kings

• The City provides recycling containers at public events such as Thursday Market.

Trees and Other Vegetation Measures

Trees, Parks, and Open Space

• In 2013, the City planted 24 trees at Centennial Park.

• In 2013, the City was awarded an Urban Greening Project grant through the Strategic Growth Council through which the Urban Tree Foundation partnered with the City to plant street trees in the downtown.

• The City's Downtown Reinvestment Fund provides loans to businesses in the downtown area for infrastructure improvements such as sidewalks, street trees, and tree grates in the form of a grant up to $10,000.

Hanford Existing Measures

- The City maintains Downtown Master Streetscape and Street Tree Plan Design Guidelines which identifies trees appropriate for the local climate. Although the Guidelines are applicable to Hanford's downtown area, the principles also apply to new development areas.

- Promote the preservation of existing mature trees and encourage the planting of appropriate shade trees in new developments (General Plan Policy OCR 7.6).
- Develop and adopt standards that provide for the planting of shade trees in new residential and commercial developments (General Plan Program OCR 7.6-A).
- All private and public development within the PC, PO, and MC designation shall prepare a landscape plan in conjunction with the parking lot plan for approval by the City (General Plan Policy LU-12.2 and LU-13).
- The City shall adopt Streetscaping standards for Arterial and Major Collector Streets (General Plan Program LU-7.1-A).
- Chapter 17.38.070: In a PO, OR, O, C PHD or I district, not less than five percent of the interior square footage of a parking area shall be landscaped with trees and other plant materials suitable for ornamentation. Parking areas are to have one tree placed at every four lineal parking spaces. Landscaped areas shall be distributed throughout the parking area and peripheral areas to the extent practical in consideration of the size and design of the parking area.
- The City is recognized as a "Tree City USA."
- The City has acquired/installed approximately 50 acres of parkland.

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APPENDIX E

COMMUNITY INVOLVEMENT

Appendix E: Community Involvement

The community outreach program was designed to be an open, inclusive, and transparent process designed to engage as many residents, business owners, and stakeholders as possible to ensure that the Regional CAP reflects the vision of the participating jurisdictions. The public outreach program involved:

- Two scheduled community meetings that introduced the project, reviewed the results of the GHG emissions inventory, and gathered ideas for the document. Meetings and workshops were held in various locations throughout the region to ensure equal access to all community members.
- Seven Advisory Committee meetings held throughout the planning process. All workshops and meetings were open to the public and all agendas, materials, and minutes were posted to allow community members who were unable to attend to keep track of the process.
- A project website (www.kingscountywidecap.com) that provided community members and stakeholders the opportunity to learn about the project and suggest ideas.
- A community survey available on the project website to allow community members to provide input regarding potential measures and implementation actions for inclusion in the CAP.
- Public comment considered during study sessions and public hearings on the CAP at participating jurisdiction's City Council meetings.
- Regular updates provided throughout the course of the project to the jurisdictions, Advisory Committee, and City Councils to keep them apprised of the CAP's progress.

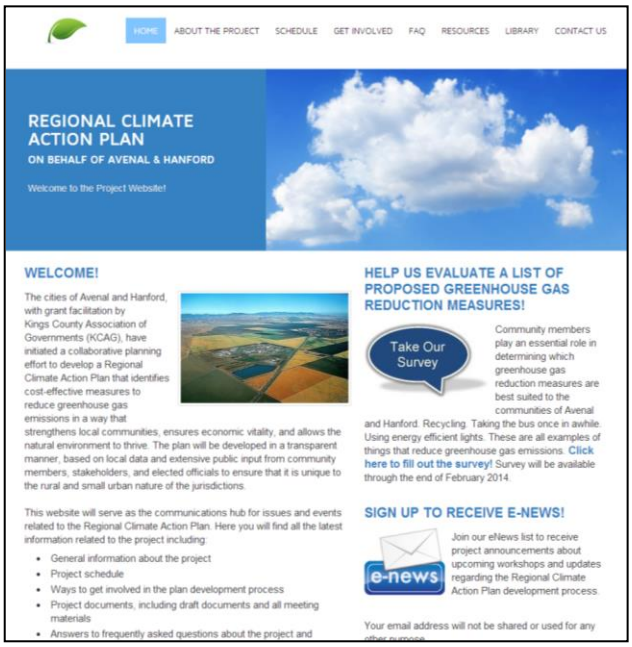
The various outreach program components are summarized below.

PROJECT WEBSITE

A project website (www.kingscountywidecap.com) was established to provide community members and stakeholders the opportunity to learn more about the project and suggest additional ideas. The website served as the communications hub for issues and events related to the Regional CAP and provided all the latest information related to the project including:

- General information about the project;
- Project schedule;
- Ways to get involved in the plan development process;
- Project documents, including draft documents and all meeting materials;
- Answers to frequently asked questions about the project and planning process; and

- Resources and reference materials providing relevant background information.


HOME
ABOUT THE PROJECT
SCHEDULE
GET INVOLVED
FAQ
RESOURCES
LIBRARY
CONTACT US
REGIONAL CLIMATE ACTION PLAN
ON BEHALF OF AVENAL & HANFORD
Welcome to the Project Website!
WELCOME!
The cities of Avenal and Hanford, with grant facilitation by Kings County Association of Governments (KCAG), have initiated a collaborative planning effort to develop a Regional Climate Action Plan that identifies cost-effective measures to reduce greenhouse gas emissions in a way that strengthens local communities, ensures economic vitality, and allows the natural environment to thrive. The plan will be developed in a transparent manner, based on local data and extensive public input from community members, stakeholders, and elected officials to ensure that it is unique to the rural and small urban nature of the jurisdictions.
This website will serve as the communications hub for issues and events related to the Regional Climate Action Plan. Here you will find all the latest information related to the project including:
General information about the project
Project schedule
Ways to get involved in the plan development process
Project documents, including draft documents and all meeting materials
Answers to frequently asked questions about the project and
HELP US EVALUATE A LIST OF PROPOSED GREENHOUSE GAS REDUCTION MEASURES!
Take Our Survey
Community members play an essential role in determining which greenhouse gas reduction measures are best suited to the communities of Avenal and Hanford. Recycling. Taking the bus once in awhile. Using energy efficient lights. These are all examples of things that reduce greenhouse gas emissions. Click here to fill out the survey! Survey will be available through the end of February 2014.
SIGN UP TO RECEIVE E-NEWS!
e-news
Join our eNews list to receive project announcements about upcoming workshops and updates regarding the Regional Climate Action Plan development process.
Your email address will not be shared or used for any

All community workshops and meetings were posted on the website along with agendas, presentations, handouts, and meeting minutes. The website also provided a location for interested community members to sign up to receive emails about the project and upcoming workshops. A community survey was posted on the project website from January 14, 2014 to February 28, 2014 to solicit input regarding potential measures and implementation actions for inclusion in the CAP.

ADVISORY COMMITTEE

As part of the community engagement program, an Advisory Committee was established to provide policy direction and assistance in the development of the Regional CAP. The Advisory Committee included local jurisdiction planning staff, citizens, and interest groups, such as the Kings County Farm Bureau, Home Builders Association of Tulare and Kings Counties, and Kings County Economic Development Corporation. The Advisory Committee helped identify realistic and obtainable measures and actions based on the region's challenges and opportunities, reviewed draft documents, and provided feedback.

CITY COUNCIL STUDY SESSIONS

Two City Council Study Sessions were held, one in each of the participating jurisdictions, to provide the Councils and the public with an update on the development of the Regional CAP and solicit feedback on proposed GHG reduction measures. The Avenal City Council Study Session was held prior to the City Council meeting on January 23, 2014. The Hanford City Council Study Session was held prior to the City Council meeting on February 4, 2014. At both sessions staff gave a brief presentation summarizing the project background, planning process, regional GHG emissions inventory and forecast, and GHG emissions reduction target. Staff provided the City Councils and members of the public with two handouts. The first handout provided a list of existing local measures that each jurisdiction has implemented, adopted, and/or programmed since the 2005 baseline inventory year that will support the proposed GHG reduction measures and implementation actions and help to reduce the region's GHG emissions. The second handout provided an overview of proposed GHG reduction measures with performance objectives, estimated GHG reduction potential, and costs/savings to the local government and the community. Staff provided instructions to the City Councils and members of the public for

providing feedback on the GHG reduction measures using the online survey posted on the project website. Council members asked several questions, to which staff responded. Staff noted that the Councils' and public's feedback would be incorporated into the Draft Regional CAP and brought back to the Councils in May 2014.